

SYSTEM FOR TRANSMITTING INFORMATION FROM A STREAMED PROGRAM TO EXTERNAL DEVICES AND MEDIA

CROSS-REFERENCE TO RELATED APPLICATIONS

The present application claims priority from US Provisional Patent 5 Application Serial No. 60/476,136, filed 5 June 2003, and from US Provisional Patent Application Serial No. 60/551,714, filed 10 March 2004, the disclosures of which are hereby incorporated herein by reference.

FIELD OF THE INVENTION

The present invention relates to interactive systems and more particularly to systems that provide services of transmitting information from a streamed broadcast program to external devices and media.

BACKGROUND OF THE INVENTION

Downloading tunes via the Internet for use as telephone rings for cellular telephones is well known in the art. Also known in the art is downloading images to cellular telephones via the Internet.

Some aspects of technologies and related art that may be useful in understanding the present invention are described in the following publications:

US Patent 5,606,365 to Maurinus et al, which describes an interactive camera for network processing of captured images;

Published US Patent application 2003/0167469 of Hardingham et al, which describes a method and system of offering for sale images related to a television program via interactive television;

Published PCT patent application WO 99/59339, which describes an interactive television system for selectively retrieving video images or teletext pages from a remote transmitter;

Published US Patent application 2003/0093786 of Amsellem, which describes an interactive television method and device;

Published PCT patent application WO 03/055217, which describes an interactive television commerce system that includes a video broadcast distribution network having multiple in-band and out-band channels;

5 Published PCT patent application WO 02/082796, which describes a video image display system that is used for interactive television, videoconferencing and telemonitoring;

10 Published PCT Application WO 01/35669 and US Patent Application No. 09/574,096, both assigned to NDS Limited, which describe a method for processing a data stream including receiving a transport stream (TS), storing at least a portion of the TS, the at least a portion of the TS having a beginning and including a plurality of TS packets, determining, from among the plurality of TS packets, at least one TS packet including a candidate access point, storing in an index store a byte offset of the candidate access point; and storing in the index store a plurality of indications of byte offset, each byte offset being associated with an arrival time of a 15 received TS packet;

20 Published PCT Application WO 03/010970, assigned to NDS Limited, which describes a method for accessing a desired point in time-synchronized data within a stream, the stream being associated with time information, the method including providing a desired presentation time associated with a desired point within a time-synchronized data stream, determining a stream access point, decoding the stream beginning at the stream access point, and assigning a time associated with the stream access point as a utilization time;

25 Published US Patent application 2003/0011636 of Feroglia et al, which describes a method for magnifying content;

an article entitled "Virtual Video Editing in Interactive Multimedia Applications", by Wendy E. Mackay and Glorianna Davenport in Communications of the ACM, Vol. 32, No. 7, July 1989, pages 802 - 810; and

a description in the world-wide-web (WWW) site www.ntp.org, which refers to the Network Time Protocol (NTP).

The disclosures of all references mentioned above and throughout the specification, as well as the disclosures of all references mentioned in those references, are hereby incorporated herein by reference.

SUMMARY OF THE INVENTION

The present invention, in preferred embodiments thereof, seeks to provide apparatus, systems and methods for enabling individual determination and selection of information, such as images and rings, to be transmitted from a displayed streamed broadcast program, and for transmitting the individually determined information to external devices and media. A non-limiting example of a displayed streamed broadcast program comprises a broadcast television program which is typically displayed on a television display.

Today, users can choose, via the Internet, only a limited number of rings and images from lists of rings and images that are predetermined by providers of the rings and the images. Users typically cannot make an arbitrary choice of rings and/or images from a streamed program, such as, for example, a streamed audio and video (A/V) program. Enabling individual determination and selection of rings and images to be transmitted to external devices and media from a streamed program makes it possible for users to have an individual "touch" with regards to usage of the external devices and media and is therefore considered desirable by the inventors of the present invention.

The external devices and media may include, for example, mobile telephones, and other personal computing, entertaining, printing, and communicating devices. The terms "mobile telephone" and "cellular telephone" are interchangeably used throughout the present specification and claims.

In a streamed program, rings and images are typically comprised in sections that are derived from the streamed program. The term "section" is used throughout the present specification and claims to include an element of a streamed program that may be used for various purposes independently from the streamed program. The purposes for which the section may be used include, for example, the following purposes: informational purposes; educational purposes; entertainment purposes; and indication purposes. For example, a section may include a video frame that may independently be used as a wallpaper image on a device, such as a mobile telephone. A section may alternatively include a plurality of video frames that provide, for example, movie scenes or a video clip that may be displayed, for

example, on a mobile telephone for entertainment purposes. Further alternatively, a section may include an audio element, such as, for example, a music tune or speech that may be used as a ring tone on a mobile telephone. Yet alternatively, a section may include a combination of audio and video, such as, for example, a video frame 5 combined with a music tune that may be rendered on a Personal Digital Assistant (PDA), for example, for educational or informational purposes. Still alternatively, a section may include a multimedia presentation, such as, for example, a presentation comprising text, an image and sounds that may be rendered on a mobile telephone for informational purposes.

10 The term “render” is used, in all its grammatical forms, throughout the present specification and claims to refer to any appropriate mechanism or method of making content palpable to one or more of the senses. In particular and without limiting the generality of the foregoing, “render” refers not only to display of video content but also to playback of audio content.

15 By way of example, the description below refers to transmission of representations of sections, where the sections comprise rings and images from television programs provided on an entertainment television channel. However, it is appreciated that the present invention is not limited to rings and images or to a specific channel or content provider, and a service for transmitting section 20 representations from a streamed program may “fit” many broadcasters, assuming that the broadcasters have an appropriate type of content. The present invention is also not limited to television programs, and the service may alternatively be used for transmission of section representations from any other appropriate type of streamed broadcast programs, such as, for example, audio programs, video programs, and 25 multimedia programs. A service for transmitting section representations from a streamed program is referred to below as a “snapshot service”.

30 The terms “representation of a section” and “section representation” are interchangeably used throughout the present specification and claims to include one of the following: the section formatted in a format that is suitable for rendering on a rendering device; metadata related to the section; and the section formatted in a format that is suitable for rendering on a rendering device and associated with

metadata related to the section. For example, a representation of a section comprising a video frame showing a person may include a bitmap of the video frame that may be used to construct, for example on a display of a mobile telephone, an image of the person as shown in the video frame.

5 The term "metadata" is used throughout the present specification and claims to include information descriptive of or otherwise referring to a content stream or a portion thereof, such as an interactive content stream. The metadata may include, for example, pointers, tags, codes, flags and indexing information. At least part of the metadata may be used to enable or disable interactive operations
10 depending, for example, on values assigned to the tags or the flags. In a case where the content stream is associated with at least one television program, the pointers, tags, codes, flags and indexing information may point to, describe, and index segments of the at least one television program and portions of the content stream. It is appreciated that the contents of the metadata may preferably pertain to either a
15 plurality of users or an individual user. The metadata may be used to enable operations on the at least one television program, if associated with the content stream, and/or on content in the content stream.

20 The present invention, in preferred embodiments thereof, also seeks to enable quick and simple use of a snapshot service because it is expected that users will act on impulse.

The present invention, in preferred embodiments thereof, further seeks to leave a target audience as much as possible in control of a final image and/or ring transmitted to their external devices.

25 The terms "tune", "ring" "polyphonic ring", and "ring tone" in singular or plural are interchangeably used throughout the present specification and claims to refer to music or sounds that may be used as a telephone ring or as background sounds for an application.

30 In a snapshot service that enables transmission of representations of sections taken from television, the snapshot service is preferably an integral part of watching television; that is, a user may decide to obtain sections comprising tunes and images while viewing, for example, the latest tunes presented in glamorous

music videos on the entertainment television channel. A section selected for transmission in a snapshot service is also referred to throughout the present specification and claims as a "snapshot-selected section".

Taking advantage of interactive capabilities of interactive television (ITV), a user may be offered a high degree of freedom. Preferably, the user, who typically has a mobile telephone and is also a user of the mobile telephone, is offered the opportunity to take a "snapshot" of what the user believes to be the most preferred background image for the mobile telephone, whether it is an image of a favorite pop star, a cartoon image or any other preferred image, including, *inter alia*, 10 a background environment image such as a landscape view. When the user presses, for example, a key on a television remote control, a visual effect, such as a flashy visual blitz effect, preferably appears on the television and a few minutes later the user preferably receives a background image on the mobile telephone.

It is appreciated that allowing individual determination and selection 15 of an image may be attractive to many television viewers that are also users of cellular telephones and may enable them to add individual "statements" and/or "touch" to ways in which the users use their cellular telephones. Such individual statements and touch cannot be achieved by letting the viewers select between a limited range of background images of which they have no control.

20 Similar freedom is preferably offered in defining rings. The viewers are preferably enabled to "record" tunes of their liking and preference, for example by pressing "start" and "stop" at any point during a music video rendered on the television.

In a snapshot service that uses ITV, at least some processing 25 regarding a snapshot-selected section is performed in a set-top box (STB) that is associated with a television display, or in a circuit providing STB functionality that is comprised in the television display. Additionally, a return path of the STB is typically used for communicating information regarding the snapshot-selected section to a headend. The term "STB" is used throughout the present specification 30 and claims to refer to either a set-top box or a circuit providing STB functionality in a television display.

Preferably, the information communicated from the STB determines and identifies the snapshot-selected section or is used by the headend to determine and identify the snapshot-selected section. After the snapshot-selected section is determined and identified, a representation of the snapshot-selected section is 5 preferably transmitted, for example to the mobile telephone of the user.

A snapshot service may also be offered to viewers of non-interactive television, such as viewers of conventional analog terrestrial television or viewers of one-way analog cable television systems. Such a snapshot service is referred to throughout the present specification and claims as an "analog snapshot service". The 10 analog snapshot service makes use of a telephone and does not use processing regarding a snapshot-selected section in an STB and a return path of the STB, as in a snapshot service that uses ITV. The analog snapshot service is therefore suitable for larger audiences and larger varieties of markets than a snapshot service that uses ITV.

15 In the analog snapshot service, a viewer who watches television may press a telephone key at an instant when a desired image appears on television. A voice response system preferably registers the time the viewer has pressed the key, and based on such a registered time, a video frame including the desired image may be determined and a representation of the video frame may be transmitted to a 20 mobile telephone of the viewer.

The viewer may similarly select a ring by, for example, pressing the telephone key at the beginning of the ring and pressing the telephone key again, or pressing another telephone key, at the end of the ring. The voice response system 25 preferably registers the times when the telephone key (or keys) were pressed, and based on such registered times, the ring is preferably determined and a representation of the ring is transmitted to the mobile telephone of the viewer.

A snapshot service may also be offered to viewers of non-interactive digital television. Such a snapshot service is also provided using a voice response system similarly to the analog snapshot service.

30 There is thus provided in accordance with a preferred embodiment of the present invention a method for selecting a section from a streamed broadcast

program, the method including receiving a streamed broadcast program, rendering the received streamed broadcast program on a display, selecting a section from the received streamed broadcast program substantially when the section is rendered on the display, and producing an indication signal which enables identification of the 5 section based on a time at which selection of the section was carried out with respect to rendering progress of the streamed broadcast program on the display.

Additionally, the method also includes identifying the section based on the indication signal. The identifying preferably includes computing, based on the indication signal, a selection time representing the time at which the selection 10 of the section was carried out within a rendering period of the streamed broadcast program on the display, and recognizing the section as a discrete section which, in a sequential series of discrete sections constructed from the streamed broadcast program, corresponds to the selection time.

15 Preferably, each of the sections in the sequential series of discrete sections is tagged with a unique identification (UID), and the recognizing includes determining a UID of the discrete section.

20 Additionally, the method also includes transmitting, in response to the identifying, a representation of the section to at least one of the following: an external device, and an external medium. The representation of the section preferably includes one of the following: the section formatted in a format that is suitable for rendering on a rendering device, metadata related to the section, and the section formatted in a format that is suitable for rendering on a rendering device and associated with metadata related to the section.

25 Alternatively, the method includes finding, in response to the identifying, a replacement section that relates to the section, and transmitting a representation of the replacement section to at least one of the following: an external device, and an external medium.

30 Preferably, the external device includes at least one of the following: a mobile telephone, a computing device, an entertainment device, a printer, and a communication device. The external medium preferably includes at least one of

the following: a medium in the external device, and a medium attached to the external device. The external medium may include a memory stick.

5 Additionally, the method also includes receiving the representation of the section embedded in at least one of the following: a Multimedia Messaging Service (MMS) message, a Wireless Application Protocol (WAP) push message, a JAVA™ application, a Short Messaging Service (SMS) message, and an electronic-mail (e-mail) message.

10 Preferably, the representation of the section is suitable for at least one of the following: playing on the external device, displaying on the external device, editing via the external device, and transmitting to another external device.

15 Additionally, the method also includes editing the representation of the section. The editing preferably includes at least one of the following: cropping a displayed area of the representation of the section, reducing a displayed area of the representation of the section, and enlarging a displayed area of the representation of the section.

Further additionally, the method also includes returning editing values of section parameters in response to the editing. The returning preferably includes returning the editing values to a server. The server is preferably associated with a headend or included in a headend.

20 Preferably, the editing values include at least one of the following: picture display coordinates, picture size information, information regarding picture elements positions, and audio parameters.

25 Additionally, the method also includes processing the representation of the section and the editing values to produce a result including at least one of the following: an edited representation of the section, and a representation of a new section, and transmitting the result, in response to the processing, to at least one of the external device and the external medium.

30 The method may additionally include transmitting a request to receive at least one of the following: a representation of a section preceding the section in the streamed broadcast program, and a representation of a section following the section in the streamed broadcast program.

Preferably, the section includes at least one of the following: an audio section, a video section, an audio and video (A/V) section, and a multimedia section. The section may preferably include at least one of the following: a video frame, at least a portion of a tune, at least a portion of a video clip, at least a portion of an audio program, and at least a portion of a television program.

5 Preferably, the streamed broadcast program includes at least one of the following: a streamed audio program, a streamed video program, a streamed A/V program, and a streamed multimedia program. The streamed broadcast program may preferably include at least one of the following: a television program, 10 an audio program, a video clip, an interactive television program, a multimedia program, and a multimedia presentation.

The identifying preferably includes identifying the section within an identification error range.

15 In accordance with a preferred aspect of the present invention the streamed broadcast program includes an analog program, the selecting includes pressing a key on a telephone keypad, and the computing includes computing the selection time at a voice response system. The analog program preferably includes at least one of the following: an audio program, a video program, an A/V program, and a multimedia program.

20 In accordance with another preferred aspect of the present invention the streamed broadcast program includes a digital program, the selecting includes pressing a key on a remote control (RC), and the computing includes computing the selection time at at least one of the following: a set-top box (STB), and a headend. The digital program preferably includes at least one of the following: an 25 audio program, a video program, an A/V program, and a multimedia program.

Preferably, the producing includes producing the indication signal at an STB. Alternatively, the producing includes producing the indication signal at a headend. Further alternatively, the producing includes producing the indication signal at a voice response system.

30 Preferably, the identifying includes identifying the section at at least one of the following: a headend, and an STB.

5 The producing preferably includes producing the indication signal unless the streamed broadcast program is marked by a mark forbidding selection of the section. Alternatively, the producing includes producing the indication signal only if the streamed broadcast program is marked by a mark allowing selection of the section. The mark preferably includes a metadata code.

The method additionally includes generating, on the display, a visual effect in response to the selecting. The visual effect preferably includes at least one of the following: a flashy visual effect, a visual blitz effect, and a flashy visual blitz effect.

10 Further additionally, the method also includes inviting a user to enter a device identification code identifying an external device to which to transmit a representation of the section. The inviting preferably includes displaying, on the display, a message inviting the user to enter the device identification code. Alternatively, the inviting includes playing a message inviting the user to enter the 15 device identification code.

Preferably, the transmitting includes producing an indication of agreement by a user to pay for the transmitting, and transmitting the representation of the section in response to the producing.

20 The editing preferably includes editing the representation of the section via one of the following: the external device, and an STB.

The method also preferably includes, prior to the selecting, inviting a user to select a desired section. The inviting preferably includes displaying a message inviting the user to select the desired section. Alternatively, the inviting includes playing a message inviting the user to select the desired section.

25 Additionally, the method also includes, prior to the selecting, accepting user input information including at least one of the following: a user's mobile telephone number, a source of a video signal received at one of the display and a user's STB, a user's mobile telephone type, an indication indicating a mobile operator that provides cellular services for the user's mobile telephone, and a target 30 mobile telephone number.

In accordance with yet another preferred aspect of the present invention, the section includes a plurality of sub-sections, and the selecting includes selecting a start sub-section and a stop sub-section from the plurality of sub-sections. In such a preferred aspect of the present invention, the method also 5 includes determining a timeout stop sub-section if the stop sub-section is not selected within a timeout period.

Also in such a preferred aspect of the present invention, the selecting includes selecting the start sub-section by pressing on a first key of an input device, and selecting the stop sub-section by pressing on a second key of the input 10 device. Alternatively, the selecting includes selecting the start sub-section by pressing once on a key of an input device, and selecting the stop sub-section by pressing again on the key of the input device.

Preferably, the display includes at least one of the following: a television, a monitor of a computing device, a display of a mobile telephone, a 15 display of an entertainment device, and a display of a communication device.

The transmitting preferably includes associating branding information identifying a provider of the section with the representation of the section. The branding information preferably includes an owner rights code.

Preferably, the UID includes an identifier based on a combination of 20 values obtained from at least one of the following: a time code, a frame counter, and a discontinuation counter. The UID may also include an identifier derived from a received broadcast transmission.

Alternatively, the UID includes an identifier derived from time information provided by an external clock.

25 Preferably, the computing also includes performing computations correcting at least one of the following: synchronization inaccuracies in at least one clock of at least one sub-system that is involved in computation of the selection time, and effect of latencies in the at least one sub-system.

The method also preferably includes transmitting the UID of the 30 section via at least one of the following: a return path of an STB, a wired communication link, and a wireless communication link.

In accordance with still another preferred aspect of the present invention, the recognizing includes finding a first preferred section and a second preferred section from a set of preferred sections representing the best sections of the sequential series of discrete sections, the first preferred section being the 5 nearest preferred section before the discrete section that corresponds to the selection time, and the second preferred section being the nearest preferred section after the discrete section that corresponds to the selection time, and selecting the section as one of the first and the second preferred sections which is closer in the sequential series of discrete sections to the discrete section that corresponds to the 10 selection time.

Preferably, the set of preferred sections includes predefined preferred sections.

Further preferably, the selecting includes selecting the section as one of the first and the second preferred sections in response to a determination of the 15 streamed broadcast program as a preview.

Additionally in such a preferred aspect of the present invention, the method also includes enabling linked access to external information via the section.

There is also provided in accordance with another preferred 20 embodiment of the present invention a method for obtaining at an external device a representation of a section, which section is obtained from a streamed broadcast program rendered on a display, the method including selecting, in a snapshot selection mode, a section from the streamed broadcast program substantially when the section is rendered on the display, identifying the section based on a time at 25 which the section was snapshot-selected with respect to rendering progress of the streamed broadcast program on the display, and transmitting a representation of the section to the external device.

In accordance with yet another preferred embodiment of the present invention there is also provided a method for preparing a streamed program in a 30 format suitable for transmission of discrete sections, the method including decoding a streamed program into a plurality of discrete sections, associating, in

synchronization, a UID with each discrete section in the plurality of discrete sections, and enabling storage and retrieval of each of the plurality of discrete sections through reference to a UID.

Preferably, the streamed program includes one of the following: an analog program, and a digital program. Each of the analog program and the digital program preferably includes at least one of the following: an audio program, a video program, an A/V program, and a multimedia program.

Additionally, the method also includes preparing a set of preferred sections representing the best sections of the plurality of discrete sections.

Preferably, the decoding includes decoding the streamed program only if the streamed program is marked by a mark allowing transmission of discrete sections.

In accordance with a preferred aspect of the present invention the streamed program includes an MPEG encoded program, and the enabling includes enabling storage of MPEG sequences.

There is also provided in accordance with a preferred embodiment of the present invention apparatus for selecting a section from a streamed broadcast program, the apparatus including a receiving and rendering device receiving a streamed broadcast program and rendering the received streamed broadcast program on a display, a user selection unit enabling selection of a section from the received streamed broadcast program substantially when the section is rendered on the display, and a controller producing an indication signal which enables identification of the section based on a time at which selection of the section was carried out with respect to rendering progress of the streamed broadcast program on the display.

In accordance with another preferred embodiment of the present invention there is also provided a system for transmitting a representation of a section, which section is obtained from a streamed broadcast program rendered on a display, the system including a user selection unit enabling selection, in a snapshot selection mode, of a section from the streamed broadcast program substantially when the section is rendered on the display, an identifier unit

identifying the section based on a time at which the section was snapshot-selected with respect to rendering progress of the streamed broadcast program on the display, and a transmitting unit transmitting a representation of the section to an external device.

5 In accordance with yet another preferred embodiment of the present invention there is also provided apparatus for preparing a streamed program in a format suitable for transmission of discrete sections, the apparatus including a decoder decoding a streamed program into a plurality of discrete sections, a unique identification (UID) control unit associating, in synchronization, a UID with each
10 discrete section in the plurality of discrete sections, and a database interface enabling storage in a section database and retrieval from the section database of each of the plurality of discrete sections through reference to a UID.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be understood and appreciated more fully from the following detailed description, taken in conjunction with the drawings in which:

5 Figs. 1A - 1D are simplified pictorial illustrations of a preferred implementation of apparatus, in different operational states, for selecting a section from a streamed broadcast program rendered on a display, the apparatus being constructed and operative in accordance with a preferred embodiment of the present invention;

10 Figs. 2A and 2B are simplified pictorial illustrations of another preferred implementation of apparatus, in different operational states, for selecting a section from a streamed broadcast program rendered on a display, the apparatus being constructed and operative in accordance with another preferred embodiment of the present invention;

15 Figs. 3A and 3B are simplified pictorial illustrations depicting editing of a representation of a section transmitted from a streamed program;

Figs. 4A - 4E are simplified pictorial illustrations depicting editing of a representation of a section via an STB;

20 Fig. 5 is a simplified pictorial illustration depicting editing of a representation of a section comprising a plurality of sub-sections;

Fig. 6 is a simplified partly pictorial, partly block diagram illustration of a preferred implementation of the apparatus of Figs. 1A - 1D including headend and broadcaster elements that are not shown in Figs. 1A - 1D;

25 Fig. 7 is a simplified partly pictorial, partly block diagram illustration of a preferred implementation of the apparatus of Figs. 2A and 2B including headend and broadcaster elements that are not shown in Figs. 2A and 2B;

Fig. 8 is a simplified partly pictorial, partly block diagram illustration of a system for providing a snapshot service in which there are various latencies;

30 Fig. 9 is a simplified block diagram illustration of a preferred implementation of an iCapture element which is operative in either of the

implementation depicted in Fig. 6 and the implementation depicted in Fig. 7 in a configuration that is suitable for processing a digital stream;

Fig. 10 is a simplified block diagram illustration of a preferred implementation of an iCapture element which is operative in either of the implementation depicted in Fig. 6 and the implementation depicted in Fig. 7 in a configuration that is suitable for processing an analog stream;

Fig. 11 is a simplified flowchart illustration of a preferred method of operation of any of the apparatus of Figs. 1A - 1D and the apparatus of Figs. 2A and 2B;

Fig. 12 is a simplified flowchart illustration of a preferred method of operation of any of the apparatus depicted in Fig. 6 and the apparatus depicted in Fig. 7; and

Fig. 13 is a simplified flowchart illustration of a preferred method of operation of any of the iCapture element of Fig. 9 and the iCapture element of Fig.

10.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

Reference is now made to Figs. 1A - 1D, which are simplified pictorial illustrations depicting a preferred implementation of apparatus 10 for selecting a section from a streamed broadcast program rendered on a display, the apparatus 10 being constructed and operative in accordance with a preferred embodiment of the present invention. The apparatus 10 is depicted in Figs. 1A - 1D in different operational states.

The streamed broadcast program preferably includes at least one of the following: a streamed audio program; a streamed video program; a streamed audio and video (A/V) program; and a streamed multimedia program. By way of example, which is not meant to be limiting, the streamed broadcast program may include at least one of the following: a television program; an audio program; a video clip; an interactive television (ITV) program; a multimedia program; and a multimedia presentation.

Further by way of example, which is not meant to be limiting, the streamed broadcast program mentioned with reference to Figs. 1A - 1D comprises a digital program.

The section is preferably derived from the streamed broadcast program. The section preferably includes at least one of the following: an audio section; a video section; an A/V section; and a multimedia section. By way of example, the section may include at least one of the following: a video frame; at least a portion of a tune; at least a portion of a video clip; at least a portion of an audio program; and at least a portion of a television program.

The display preferably includes at least one of the following: a television; a monitor of a computing device; a display of a mobile telephone; a display of an entertainment device; and a display of a communication device. By way of example, which is not meant to be limiting, the display on which the streamed broadcast program is rendered in Figs. 1A - 1D comprises a television display 20.

Reference is now specifically made to Fig. 1A.

The apparatus 10 may preferably be used by a user 30 in a snapshot service for transmitting a representation of a section, for example to an external device or an external medium. The apparatus 10 may preferably be used when the user 30 views the streamed broadcast program on the television display 20.

5 The snapshot service preferably enables the user 30 to individually determine and select for transmission information which is displayed on the television display 20. Such information is also referred to throughout the present specification and claims as "snapshot-selected information". By transmitting the snapshot-selected information, for example, to an external device comprising a
10 mobile telephone 40 of the user 30, the user 30 may create an individual statement, in terms of visuals and/or audio. For example, if the snapshot-selected information includes a background image, the background image may be used as a wallpaper image on the mobile telephone 40. If the snapshot-selected information includes a polyphonic ring, the polyphonic ring may be used as a start-up sound or a ring tone
15 on the mobile telephone 40. The snapshot-selected information may thus distinguish a "look and feel" of the mobile telephone 40 from other mobile telephones of other users.

20 The snapshot-selected information may also, for example, be transmitted in an electronic-mail (e-mail) message, for example to a friend of the user 30. It is also possible to set-up related websites where users can submit
various snapshot-selected information items for others to review and comment (but not copy), for participation in competitions, etc.

25 The snapshot-selected information is typically comprised in a section which is snapshot-selected (snapshot-selected section). The snapshot-selected information comprised in the snapshot-selected section may, for example, include an image or a ring.

30 It is appreciated that the section is preferably snapshot-selected at the discretion of the user 30 from the streamed broadcast program which is rendered on the television display 20.

For simplicity of depiction and description, and without limiting the generality of the foregoing, the description below refers to the mobile telephone 40

of the user 30 as an external device for which the snapshot service is intended and to which a representation of the snapshot-selected section is transmitted. However, it is appreciated that the present invention is not limited to mobile telephones as external devices, and other appropriate types of external devices may alternatively be used. The present invention is also not limited to the mobile telephone 40 of the user 30 as the external device to which the representation of the snapshot-selected section is transmitted; the representation of the snapshot-selected section may alternatively or additionally be transmitted to an external device other than the mobile telephone 40, such as, for example, a mobile telephone (not shown) of a friend of the user 30.

The other appropriate types of external devices (not shown) for which the snapshot service may be intended and to which a representation of the snapshot-selected section may be transmitted preferably include at least one of the following: a computing device; an entertainment device; a printer; and a communication device. Appropriate types of external medium (not shown) for which the snapshot service may be intended and to which a representation of the snapshot-selected section may be transmitted preferably include at least one of the following: a medium in an external device of any of the types mentioned above; and a medium attached to the external device. For example, an external medium may include a hard disk (HD) in an external device comprising, for example, a personal computer (PC), or a memory stick associated with an external device comprising, for example, a laptop PC.

The apparatus 10 preferably includes the following elements: a user selection unit; a controller; and a receiving and rendering device. The user selection unit may preferably include a user input device, such as, for example, a remote control (RC) 50. The controller may preferably include a controller 55 that may, for example, include a conventional micro-controller or a conventional micro-processor, or any other suitable processor or controller. The receiving and rendering device may preferably include an STB 60. The controller 55 may, for example, be comprised in or associated with the STB 60. The RC 50 may preferably be used to control operation of the STB 60.

The STB 60 is preferably operatively associated with the television display 20. Preferably, the STB 60 includes a return path to a headend (not shown). The return path may, for example, be provided by a telephonic modem or a cable modem (both not shown). The STB 60 preferably receives broadcast transmissions broadcast by the headend and renders the broadcast transmissions on the television display 20. The STB 60 may also transmit to the headend, via the return path, at least one of the following: user information entered by the user, for example, via the RC 50; billing information; and information to be used for management operations.

10 The broadcast transmissions typically include television programming, ITV programming, audio programming and, in some cases, multimedia programming. The streamed broadcast program is preferably comprised in the broadcast transmissions.

15 In operation, the streamed broadcast program is received at the STB 60, and the STB 60 preferably renders the received streamed broadcast program on the television display 20. The user 30 may use the apparatus 10 for taking a snapshot of a desired section from the streamed broadcast program which is rendered on the television display 20. By way of example, the streamed broadcast program may be a live show in which a singer is shown performing. The live show 20 is provided; for example, on an entertainment television channel. Being, for example, a fan of the singer, the user 30 may want to snap a section comprising a picture of the singer from the streamed broadcast program for use as a background image on the mobile telephone 40. Alternatively, the user 30 may want to snap at least a portion of a song sung by the singer for use as a ring in the mobile 25 telephone 40.

30 Opportunities to take such a snapshot are preferably indicated or promoted, for example, by displaying a snapshot enabled (SE) icon 70 and a remote control reference icon 80 on the television display 20. Alternatively or additionally, opportunities to take snapshots may be indicated or promoted by inviting the user 30 to select a desired section. It is appreciated that the user 30

may be invited to select the desired section by displaying a message (not shown) or playing a message (not shown) inviting the user 30 to select the desired section.

5 In the operational state depicted in Fig. 1A, the user 30 is shown selecting a section from the received streamed broadcast program substantially when the section is rendered on the television display 20. The user 30 may preferably select the section, for example, by pressing a dedicated key on the RC 50, such as the yellow key, at an instant when the section is rendered on the television display 20. Pressing the key on the RC 50 is preferably translated, for example in the STB 60, to an instruction to instantly snap the section.

10 15 20 In response to the user 30 selecting the section, a visual effect may preferably be generated and displayed on the television display 20 as shown in the operational state depicted in Fig. 1B. The visual effect may preferably include at least one of the following: a flashy visual effect; a visual blitz effect; and a flashy visual blitz effect. The term "flashy visual effect" is used throughout the present specification and claims to include a visual effect which is similar to a visual effect resulting from a camera flash operation. The term "visual blitz effect" is used throughout the present specification and claims to include any appropriate visual effect which is visible for a short time period. The term "flashy visual blitz effect" is used throughout the present specification and claims to include an effect which is both visual for a short time period and similar to a visual effect resulting from a camera flash operation.

25 It is appreciated that the visual effect may be generated as the user 30 selects the section, or shortly thereafter. The visual effect preferably indicates a picture being currently taken. For example, in a case where the visual effect comprises a flashy visual blitz effect, the visual effect is preferably visible for a short time period equivalent to display of a few video frames starting from a picture frame being snapped.

In a case where the section includes only audio, an audible signal may replace the visual effect.

30 It is appreciated that although selection accuracy cannot typically be guaranteed, it is expected that the user 30 may be able to select the section with a

satisfactory accuracy because displaying the visual effect typically resembles a flash usage in a conventional film camera. Since many users have learned to operate film cameras in a satisfactory way, it is anticipated that taking a snapshot may also be learned, enabling provision of satisfactory results.

5 Also in response to the user 30 selecting the section, the controller 55 in the STB 60 preferably produces an indication signal which enables identification of the section based on a time at which selection of the section was carried out with respect to rendering progress of the streamed broadcast program on the television display 20. Alternatively, the indication signal may be produced 10 at headend equipment (not shown) at the headend in response to receipt of an input from the controller 55.

15 It is appreciated that the indication signal is preferably produced unless the streamed broadcast program is marked by a mark forbidding selection of the section. Alternatively, the indication signal is preferably produced only if the 20 streamed broadcast program is marked by a mark allowing selection of the section. The mark preferably includes a metadata code.

25 After the section has been selected, that is “snapped”, the user 30 is preferably invited to enter a device identification code that identifies a target external device to which to transmit a representation of the snapshot-selected section. The term “device identification code” is used throughout the present specification and claims to include a code that identifies an external device or an external medium. The device identification code typically includes numerals and/or characters. The device identification code may, for example, include at least one of the following: a dial number; a name; an electronic-mail address; a string of 30 characters; a string of numbers; and a string including a combination of characters and numbers.

30 The term “target external device” is used throughout the present specification and claims to include any external device or external medium of the types mentioned above for which transmission of a representation of a snapshot-selected section is intended.

By way of example, which is not meant to be limiting, the description below refers to a dial number as a device identification code which identifies the target external device, but it is appreciated that the target external device may alternatively be identified by any other appropriate type of device identification code.

It is appreciated that the user 30 may, for example, be invited to enter the dial number by displaying on the television display 20 a message inviting the user to enter the dial number as shown in the operational state depicted in Fig. 1C. Alternatively, the user 30 may be invited to enter the dial number by playing a message inviting the user to enter the dial number.

In response to the message inviting the user to enter the dial number, the user 30 may preferably enter the dial number, for example, by pressing corresponding numeral keys on the RC 50. In the operational state depicted in Fig. 1C, the user 30 is shown pressing a key on the RC 50 as part of entering the dial number.

It is appreciated that in a case where the target external device is the mobile telephone 40, the user 30 may enter the dial number of the mobile telephone 40 in advance as a default pre-programmed dial number, in which case the operational state of Fig. 1C may be optional. Alternatively or additionally, the user 30 may be presented with a message requesting the user 30 to confirm that the representation of the snapshot-selected section is to be transmitted to the mobile telephone 40.

Additional information may also be entered or requested. For example, prior or subsequent to selecting the section, one or more screens may be displayed to the user 30 in which the user 30 may be requested to enter user input information comprising at least one of the following: a source of a video signal received at the STB 60, such as a cable source or a source for transmission via satellite; a type of the mobile telephone 40; and an indication indicating a mobile operator that provides cellular services for the mobile telephone 40.

It is appreciated that information regarding a mobile telephone type and a mobile operator may also be requested for a target external device other than

the mobile telephone 40, in which case the user 30 may enter such information before or after entering the dial number of the target external device.

In accordance with another preferred embodiment of the present invention the user 30 may pre-register to the snapshot service, at which time the user 5 30 may preferably enter the dial number and the user input information. Then, each time the user 30 wants to use the snapshot service the user 30 is only requested to input minimal identifying information, such as, for example, a password. In accordance with yet another preferred embodiment of the present invention, after the user 30 pre-registers to the snapshot service, the dial number may be automatically 10 identified using CLI (Calling Line Identification) of a telephone number of the user 30 so that the user 30 need not explicitly enter any identifying data at all. In accordance with still another preferred embodiment of the present invention, the dial number and the user input information entered on pre-registration may be stored as a “cookie” in the STB 60 and provided automatically to the headend during a callback 15 via the return path, as is well known in the art.

The user input information, as well as the default pre-programmed dial number, may, for example, be stored in a memory (not shown) that is associated with the controller 55.

After the dial number is entered by the user 30 or otherwise obtained 20 from the memory, one or more validation and confirmation pop-up screens may be presented to the user 30 as part of a procedure for order confirmation and monetary transaction for payment for the snapshot service. In such a procedure, an indication of agreement by the user 30 to pay for usage of the snapshot service for transmitting the representation of the section may be produced, for example at the 25 STB 60 and/or at the headend. It is appreciated that the payment may be in the form of a micro-payment, as is well known in the art. It is further appreciated that for promotion purposes some snapshot transmissions may be provided for free whereas others may be provided for a price. It is further appreciated that snapshots from different streamed broadcast programs may be differently priced.

30 The operational state depicted in Fig. 1D refers to a state after the dial number was entered by the user 30 or otherwise obtained from the memory,

and after the indication of agreement by the user 30 to pay for usage of the snapshot service for transmission of the representation of the section was produced, confirmed and validated. In such a case, the section is preferably identified based on the indication signal, that is, ultimately on the time at which 5 the selection of the section was carried out with respect to rendering progress of the streamed broadcast program on the television display 20. Preferably, identification of the section is carried out at at least one of the following: the headend; and the STB 60. It is appreciated that the identification of the section at the headend may preferably be carried out at the headend equipment.

10 In a case where the identification of the section is carried out at the STB 60, the STB 60 may, for example, be assisted by timing information transmitted from the headend. The ability to identify the section at the STB 60 typically depends on processing power and memory capacity of the STB 60. For example, an STB comprising or associated with a personal video recorder (PVR), 15 such as an XTV™ system, commercially available from NDS Limited, One London Road, Staines, Middlesex, TW18 4EX, United Kingdom, may have appropriate processing power and memory capacity for identifying the section.

20 Preferably, the identification of the section is performed by computing or deriving, based on the indication signal, a selection time representing the time at which the selection of the section was carried out within a rendering period of the streamed broadcast program on the television display 20, and recognizing the section as a discrete section which, in a sequential series of discrete sections constructed from the streamed broadcast program, corresponds to 25 the selection time. Each of the sections in the sequential series of discrete sections is preferably tagged with a unique identification (UID), and the section is preferably recognized by determining a UID of the discrete section. The selection time is preferably computed at at least one of the following: the STB 60; and the headend equipment.

30 The UID of the discrete section, which now becomes the UID of the snapshot-selected section, is obtained either at the STB 60 or at the headend depending on where the identification of the section is carried out. If the

identification of the section is carried out at the STB 60, the STB 60 preferably transmits the UID of the section to the headend equipment via at least one of the following: the return path; a wired communication link; and a wireless communication link.

5 Based on the UID, the headend equipment preferably obtains the section and provides, for example through a server (not shown) associated with the headend equipment and/or comprised in the headend, a representation of the section to a mobile delivery system (not shown) that may comprise, for example and without limiting the generality of the foregoing, a Multimedia Messaging Service (MMS) gateway (not shown). The representation of the section may 10 preferably be prepared and formatted in a format that is supported by the mobile telephone 40, such as, for example, a Portable Network Graphics (PNG) format or a Joint Photographic Experts Group (JPEG) format. It is appreciated that in a case where the representation of the section is to be transmitted to an external device 15 other than the mobile telephone 40, the format in which the representation of the section is prepared preferably corresponds to a format supported by the external device other than the mobile telephone 40.

20 The mobile delivery system preferably transmits the representation of the section to the target external device, that is, the mobile telephone 40. It is appreciated that if the user 30 has specified, in the operational state of Fig. 1C, an external device other than the mobile telephone 40 or an external medium as the target external device, the mobile delivery system preferably transmits the representation of the section to the external device other than the mobile telephone 40 or to the external medium.

25 In a case where the representation of the section comprises metadata related to the section, the metadata may, for example, include information that may be of use to the user 30. For example, the metadata related to the section may include statistics information about an actor in the streamed broadcast program or specifically about an actor that appears in the section, offers to buy products that 30 may be associated with the actor, etc.

It is appreciated that in some cases the user 30 may want to receive a representation of a replacement section that relates to the section rather than the representation of the section. For example, instead of receiving an image of an actor that appears in the section, the user 30 may want to receive a picture of the 5 actor when the actor was a baby. In such a case, once the UID is identified and obtained, the headend equipment preferably finds the replacement section, that may preferably be tagged with a sub-UID or otherwise mapped to the UID of the section, and provides a representation of the replacement section to the mobile delivery system for transmission to the mobile telephone 40. The replacement 10 section may, for example, be retrieved from a database (not shown) of replacement sections.

For simplicity of depiction and description, and without limiting the generality of the foregoing, the description below refers to a representation of a section but it is appreciated that a representation of a replacement section may 15 alternatively be treated and referred to.

Preferably, the mobile delivery system transmits the representation of the section to the mobile telephone 40 embedded in at least one of the following: an MMS message; a Wireless Application Protocol (WAP) push message; a JAVA™ application; a Short Messaging Service (SMS) message; and 20 an e-mail message.

After the user 30 receives the representation of the section at the mobile telephone 40, the user 30 may use the representation of the section on the mobile telephone 40. Preferably, the representation of the section is suitable for at least one of the following: playing on the mobile telephone 40; displaying on the 25 mobile telephone 40; editing via the mobile telephone 40; and transmitting to another external device (not shown).

Editing via the mobile telephone 40 is enabled if the representation of the section is received at the mobile telephone 40 embedded in a JAVA™ application or if the mobile telephone 40 has advanced editing software that 30 enables editing of the representation of the section when the section representation is embedded in other message types. If the representation of the section is received

at the mobile telephone 40 embedded in one of an MMS message, a WAP push message, an SMS message, and an e-mail message, and the mobile telephone 40 does not have appropriate corresponding editing software, the representation of the section may, for example, be edited via the STB 60.

5 In a case where the user 30 chooses to edit the representation of the section, a new communication session is typically performed in order to obtain a representation of a new section that corresponds to a requested editing. The new communication session is typically performed because the JAVA™ application, for example, does not typically have access to a memory (not shown) in the mobile
10 telephone 40 and thus the JAVA™ application cannot store editing information or a resulting edited section representation in the memory of the mobile telephone 40. It is appreciated that access to the memory of the mobile telephone 40 is typically restricted in order to protect vital information, such as telephone numbers, that is typically stored in the memory of the mobile telephone 40. However, if the
15 memory of mobile telephone 40 has a capacity for storage of editing information or edited section representations separately from and in addition to the vital information, performance of the new communication session to obtain the representation of the new section may be optional.

20 The new communication session may be performed either via the return path to the headend or via a cellular communication session via the mobile delivery system. Editing of the representation of the section preferably results in generation of editing values of section parameters that comprise, for example and without limiting the generality of the foregoing, at least one of the following: picture display coordinates; picture size information; information regarding picture
25 elements positions; and audio parameters. The editing values are preferably returned to the server. The server preferably processes the representation of the section and uses the editing values to produce the representation of the new section, and transmits the representation of the new section to the mobile telephone 40 via the mobile delivery system.

30 If the representation of the section is to be edited via the STB 60, the representation of the section may be transmitted, for example via the return path,

to the STB 60. By way of example, which is not meant to be limiting, the representation of the section may be transmitted as a bitmap in the bit-mapped graphics (BMP) format or as a still image in an MPEG (Moving Picture Experts Group) format. The user 30 may then preferably edit the bitmap or the still image 5 when displayed on the television display 20. When the user 30 terminates editing of the representation of the section, editing values resulting from the editing are preferably communicated from the STB 60 to the server via the return path. The server preferably processes the representation of the section, and the editing values 10 to produce a result comprising at least one of the following: an edited representation of the section; and a representation of a new section. The result is then sent to the mobile telephone 40.

It is appreciated that instead of or in addition to editing the representation of the section, the user 30 may choose to request that a representation of a previous or following section be transmitted to the mobile 15 telephone 40. In such a case, the user 30 may, for example, use the mobile telephone 40 to initiate a snapshot transmission transaction in which a request to obtain another section representation is transmitted to the headend via the mobile delivery system. The user 30 may preferably include in the request a specification 20 of a newly requested section whose section representation is requested. The specification of the newly requested section may, for example, include an indication of whether the newly requested section precedes or follows the snapshot-selected section in the streamed program, and an indication of a number of sections by which the newly requested section precedes or follows the snapshot-selected section in the streamed program. Based on the specification of the newly 25 requested section, the headend may transmit a section representation of the newly requested section to the mobile telephone 40 via the mobile delivery system.

It is appreciated that the request to obtain another section representation may alternatively be transmitted to the headend in a snapshot transmission transaction conducted via the return path of the STB 60, in which 30 case the user 30 may use the RC 50 to enter the specification of the newly requested section.

Typically, the representation of the section is received at the mobile telephone 40 a short time period after the user 30 has snapshot-selected the section. The short time period may, for example, be a few minutes long and rendering of the streamed broadcast program on the television display 20 typically continues 5 during the short time period. The representation of the section received at the mobile telephone 40 corresponds to the section that was displayed on the television display 20 at the time the section was snapshot-selected.

It is appreciated that the snapshot service also preferably offers an opportunity to increase brand loyalty of users because, similarly to use of pictures 10 in an album, the users may want to show obtained snapshots to other people. For such a purpose, the transmitted representation of the section is preferably associated with branding information identifying a provider of the section. The branding information preferably includes an owner rights code, and, for example, a logo of the provider embedded in the representation of the section for marketing 15 promotion purposes. The owner rights code may preferably be comprised in metadata related to the section.

In a case where the user 30 wants to snap at least a portion of a song sung by the singer for use as a ring on the mobile telephone 40, a desired section selected by the user 30 will typically cover an interval within which at least a 20 portion of the song is performed. Such an interval is also referred to throughout the present specification and claims as an "audio interval". The desired section then preferably includes a plurality of sub-sections covering the audio interval, and the user 30 preferably selects a start sub-section and a stop sub-section from the plurality of sub-sections. The start sub-section then corresponds to a beginning of 25 the ring and the stop sub-section corresponds to an end of the ring.

The term "sub-section" is used throughout the present specification and claims to include a portion of a section. For example, in a case where the section includes a video clip comprising a plurality of video frames, a sub-section of the section may, for example, include any one of the video frames. In a case 30 where the section includes, for example, a three-minutes long audio clip

comprising a song, a sub-section of the section may, for example, include any one-second long part of the audio clip.

Preferably, the user 30 selects the start sub-section by pressing on a first key of the RC 50, and the stop sub-section by pressing on a second key of the 5 RC 50. Alternatively, the user 30 may select the start sub-section by pressing once on a key of the RC 50, such as the blue key, and the stop sub-section by pressing again on the blue key.

It is appreciated that, if the user 30 does not select the stop sub-section within a timeout period, the controller 55 may determine a timeout stop 10 sub-section and use the timeout stop sub-section as an actual stop sub-section, thus automatically terminating snapshot taking after the timeout period.

Once the desired section covering the audio interval in the song is selected by the user 30, operations corresponding to operations mentioned above with reference to snapping the picture of the singer may be performed in a similar 15 manner. Such operations include, *inter alia*, identification, transmission, editing, and usage of the desired section.

In a case where the user 30 wants to snap more than one picture of the singer, such as a portion of a video clip or a commercial, a desired section selected by the user 30 will typically cover an interval within which a plurality of 20 video frames are displayed. Such an interval is also referred to throughout the present specification and claims as a "video interval". In such a case, selection of the video interval may be performed as in the case of the audio interval, and operations corresponding to operations mentioned above with reference to snapping the at least a portion of the song may be performed in a similar manner.

25 In general, it is appreciated that the present invention enables a concept of "An item that can be snapped can be transmitted".

Reference is now made to Figs. 2A and 2B, which are simplified pictorial illustrations of another preferred implementation of apparatus 100 for selecting a section from a streamed broadcast program rendered on a display, the 30 apparatus 100 being constructed and operative in accordance with another

preferred embodiment of the present invention. The apparatus 100 is depicted in Figs. 2A and 2B in different operational states.

The apparatus 100 is particularly useful for enabling an analog snapshot service in non-interactive television systems. Non-interactive television systems typically include conventional analog terrestrial television systems and one-way analog cable television systems. Conventional analog terrestrial television typically does not use STBs, and STBs in some analog cable television systems do not have return paths. Therefore, a solution that does not involve STBs is preferably used in order to enable the analog snapshot service in non-interactive television systems. It is anticipated that such a solution may fit larger audiences and larger varieties of markets than a snapshot service that uses STBs because worldwide penetration of interactive television is still lower than penetration of conventional analog terrestrial television and one-way analog cable television.

It is appreciated that the apparatus 100 may also be useful for enabling a snapshot service in digital television systems, such as digital cable or satellite television systems, for example in cases where return paths from STBs are not available or are temporarily unusable.

By way of example, which is not meant to be limiting, the apparatus 100 is mentioned with reference to Figs. 2A and 2B in the context of an analog snapshot service, and the streamed broadcast program mentioned with reference to Figs. 2A and 2B includes an analog program. The section, which is preferably derived from the analog program, is also analog in form. The analog program preferably includes at least one of the following: an audio program; a video program; an A/V program; and a multimedia program. By way of example, the streamed broadcast program may preferably include at least one of the following: a television program; an audio program; a video clip; and a multimedia program.

In respect of the analog program, an analog multimedia program may include, for example, a combination of at least two of the following: audio; video; and text.

The section preferably includes at least one of the following: an audio section; a video section; an A/V section; and a multimedia section. By way

of example, the section may preferably include at least one of the following: a video frame; at least a portion of a tune; at least a portion of a video clip; at least a portion of an audio program; and at least a portion of a television program.

5 The display may preferably be similar to the display mentioned above with reference to Figs. 1A - 1D. By way of example, which is not meant to be limiting, the display on which the analog program is rendered in Figs. 2A and 2B comprises a television display 110.

Reference is now specifically made to Fig. 2A.

10 The apparatus 100 may preferably be used by a user 120 for obtaining a representation of a section, for example at a mobile telephone 130 of the user 120. Alternatively or additionally, the apparatus 100 may be used by the user 120 for placing an order to transmit the representation of the section to another mobile telephone, such as, for example, a mobile telephone (not shown) of a friend of the user 120. The section is preferably selected at the discretion of the 15 user 120 from the streamed broadcast program which is rendered on the television display 110.

20 Similarly to the apparatus 10 of Figs. 1A - 1D, the apparatus 100 preferably includes a user selection unit, a controller, and a receiving and rendering device. The user selection unit in the apparatus 100 is implemented via a telephone keypad 140 which is preferably comprised in a telephone, such as, for example, the mobile telephone 130. Alternatively, the user selection unit may be implemented via a telephone keypad (not shown) comprised in a conventional wired telephone (not shown).

25 The controller preferably includes a controller 150 that may be comprised in or associated with a voice response system (VRS) 160 which is typically remote from the mobile telephone 130. The controller 150 may, for example, include a conventional micro-controller or a conventional micro-processor, or any other suitable processor or controller.

30 The receiving and rendering device of the apparatus 100 may, for example, be implemented via the television display 110 or via an antenna (not shown) associated with the television display 110.

In operation, the user 120 preferably uses the mobile telephone 130 for placing a call to the VRS 160 in order to initiate a snapshot session enabling the user 120 to take a snapshot of a desired section from the streamed broadcast program. A telephone number of the VRS 160 may, for example, be provided by a provider of the analog snapshot service and displayed on the television display 110 when the analog snapshot service is made available.

The session thus initiated by the user 120 is preferably responded by the VRS 160. The VRS 160 may, for example, introduce and explain the analog snapshot service, and request the user 120 to input information typically including a telephone number of the mobile telephone 130 and an indication of agreement by the user 120 to pay for usage of the analog snapshot service. It is appreciated that entering the telephone number of the mobile telephone 130 may be optional in a case where the VRS 160 may autodetect the telephone number of the mobile telephone 130, or in a case where the user 120 pre-registers to the analog snapshot service as mentioned above with reference to Figs. 1A - 1D.

After the user 120 enters the information, the VRS 160 preferably processes and validates the information. After the information entered by the user 120 is validated, the VRS 160 is ready to accept a selection from the user 120. The VRS 160 then preferably prompts the user 120 to make an individual determination and selection of information to be transmitted, by way of example to the mobile telephone 130. The user 120 then waits until a desired section appears on the television display 110.

When the user 120 notes the desired section on the television display 110, the user 120 preferably selects the desired section by pressing a key on the keypad 140 of the mobile telephone 130. The VRS 160 preferably records such a key press and computes a selection time at which the user 120 has pressed the key on the keypad 140. It is appreciated that the VRS 160 may compute the selection time by using, for example, an input from an external clock (not shown). Based on recording of the key press and computation of the selection time, the VRS 160 preferably produces an indication signal which enables identification of the section based on a time at which selection of the section was carried out with respect to

rendering progress of the streamed broadcast program on the television display
110.

Preferably, the VRS 160 transmits the indication signal to a headend (not shown) where the section is preferably identified based on the indication signal. Identification of the section may, for example, be performed as mentioned above with reference to Figs. 1A - 1D by computing, or alternatively deriving, the selection time, and recognizing the section as a discrete section which, in a sequential series of discrete sections constructed from the streamed broadcast program, corresponds to the selection time. Preferably, each of the sections in the sequential series of discrete sections is tagged with a UID, and the section is recognized by determining a UID of the discrete section.

After the section is identified, the headend preferably obtains the section and provides, for example through a server (not shown) at the headend, a representation of the section to a mobile delivery system (not shown) that may comprise, for example and without limiting the generality of the foregoing, an MMS gateway (not shown). The mobile delivery system preferably transmits the representation of the section to the mobile telephone 130 as shown in Fig. 2B. The representation of the section received at the mobile telephone 130 may, for example, be used as a wallpaper presentation or a start-up sound. It is appreciated that the user 120 may also edit the representation of the section via the mobile telephone 130.

In a case where the user 120 chooses to edit the representation of the section, a new communication session is typically performed in order to obtain a representation of a new section that corresponds to a requested editing. The new communication session is preferably performed via a cellular communication session to the mobile delivery system. The editing of the representation of the section preferably results in generation of editing values of section parameters that comprise, for example and without limiting the generality of the foregoing, at least one of the following: picture display coordinates; picture size information; information regarding picture elements positions; and audio parameters. The mobile delivery system preferably provides the editing values to the server. The

server preferably processes the representation of the section and uses the editing values to produce the representation of the new section, and transmits the representation of the new section to the mobile telephone 130 via the mobile delivery system.

5 It is appreciated that instead of or in addition to editing the representation of the section, the user 120 may choose to request that a representation of a previous or following section be transmitted to the mobile telephone 130. Such a request is preferably transmitted and treated as mentioned above with reference to Figs. 1A - 1D.

10 In order to reduce costs associated with cellular communication sessions, the user 120 may alternatively use a conventional wired telephone for communication with the VRS 160 and for selection of the section. In such a case, the user 120 may select the section by pressing a key on a keypad of the wired telephone, and once the section is selected and identified, the section may be 15 transmitted to the mobile telephone 130 via the mobile delivery system.

20 In a case where the user 120 wants to snap a section comprising a video interval or an audio interval, selection of the section may be performed by 25 pressing a key (or keys) on the keypad 140 to select a start sub-section and a stop sub-section as mentioned above with reference to Figs. 1A - 1D. The VRS 160 preferably determines times at which the start sub-section and the stop sub-section were selected, and based on a determination of such times generates indication signals that are transmitted to the headend. The headend identifies the start sub-section and the stop sub-section, and transmits, via the mobile delivery system, the section comprising sub-sections between the start sub-section and the stop sub-section.

30 It is appreciated that when using a snapshot service, regardless of whether the service is used with a streamed digital program or a streamed analog program, a user using the service may want to receive a section having a higher quality than a section being actually snapped, since snapping a section may result in a less-than-optimal result. The higher quality may be expressed in terms of, for example, viewing angles of items in the section, display of a complete item as

opposed to display of a part of the item, etc. In such a case, when preparing a sequential series of discrete sections from a streamed digital program or a streamed analog program, a set of preferred sections representing the best sections of the sequential series of discrete sections may also be prepared. It is appreciated that 5 preparation of the sequential series of discrete sections is typically made automatically, but preparation of the set of preferred sections typically involves predefinition of the preferred sections by an operator.

In order to transmit, from a streamed digital program or from a streamed analog program, a section having a higher quality than a section being 10 actually snapped, section identification is preferably altered so that a section to be transmitted is no longer a snapped section but rather a preferred section. Preferably, after computation of a selection time of the snapped section, the section to be transmitted is recognized by finding a first preferred section and a second preferred section from the set of preferred sections, where the first preferred 15 section is the nearest preferred section before the snapped section, and the second preferred section is the nearest preferred section after the snapped section, and selecting the section to be transmitted as one of the first and the second preferred sections which is closer in the sequential series of discrete sections to the snapped section. Preferably, linked access to external information is enabled via the section 20 to be transmitted.

It is appreciated that such replacement of the snapped section by a preferred section may preferably be performed in response to a determination of the streamed program as a preview.

It is further appreciated that in any of the apparatus 10 of Figs. 1A - 25 1D and the apparatus 100 of Figs. 2A and 2B a snapped section or a preferred section may be ordered in a hard copy form, for example by a user inputting an appropriate input parameter. In such a case, a representation of the snapped section or the preferred section may be printed and sent, for example by mail, to the user.

Reference is now made to Figs. 3A and 3B, which are simplified 30 pictorial illustrations depicting editing of a representation of a section transmitted from a streamed program. The representation of the section is, by way of example,

transmitted by a server (not shown) as part of a first snapshot transmission transaction.

It is appreciated that the representation of the section may be transmitted either from a streamed digital program or from a streamed analog program. Furthermore, editing of the representation of the section does not depend on whether the representation of the section was transmitted from a streamed digital program or from a streamed analog program, and similar editing operations may be performed on a representation of a section transmitted from a streamed digital program and on a representation of a section transmitted from a streamed analog program.

10 program.

By way of example, editing of the transmitted representation of the section is shown in Figs. 3A and 3B to occur via the mobile telephone 40 of Figs. 1A - 1D, but it is appreciated that similar editing may be performed via the mobile telephone 130 of Figs. 2A and 2B, or on via any other appropriate type of external device mentioned above. It is further appreciated that in a case where the section was selected via an STB, such as the STB 60 of Figs. 1A - 1D, and the representation of the section was transmitted from a streamed digital program rendered via the STB, editing of the transmitted representation of the section may alternatively be performed via the STB.

20 Further by way of example, the transmitted representation of the section comprises an image, for example, a picture of a singer.

Still further by way of example, the editing of the representation of the section via the mobile telephone 40 is performed by the user 30 of Figs. 1A - 1D (not shown in Figs. 3A and 3B).

25 Preferably, editing of the representation of the section includes at least one of the following: cropping a displayed area of the representation of the section; reducing a displayed area of the representation of the section; and enlarging a displayed area of the representation of the section.

30 The image as received is shown in Fig. 3A. If the user 30 prefers to maintain the image as received, the user 30 may select a "COOL" option meaning that the user 30 is satisfied with the image as received. Selection of the COOL

option may, for example, be performed by pressing numeral key "1" on the mobile telephone 40.

If the user 30 is not satisfied with the image as received, the user 30 may select a "CROP" option, for example, by pressing numeral key "3" on the 5 mobile telephone 40, in order to get a different rendering of the singer as shown in Fig. 3B. When the user 30 selects the CROP option, a proportional focus area of the image is, for example, brought forward. The proportional focus area of the image may then preferably be moved around a display screen 180 of the mobile telephone 40, for example by pressing conventional arrow keys 185 of the mobile 10 telephone 40. Also, by pressing another set of keys, such as "+" and "-" if available, or numeral keys, it may be possible to reduce or enlarge the focus area of the image.

After the user 30 completes making editing changes, a second snapshot transmission transaction is initiated and carried out, for example through 15 a communication session over the mobile telephone 40, to obtain another image that corresponds to a requested editing. The second snapshot transmission transaction is preferably performed similarly to the first snapshot transmission transaction. Preferably, editing of the image returns editing values to the server, which will then transmit a representation of a new section or a representation of an 20 edited section to the mobile telephone 40.

Reference is now made to Figs. 4A - 4E, which are simplified pictorial illustrations depicting editing of a representation of a section via an STB. The representation of the section is preferably received in a first snapshot transmission transaction.

25 Preferably, editing of the representation of the section via the STB is similar to editing of a representation of a section as described above with reference to Figs. 3A and 3B. By way of example, which is not meant to be limiting, in Figs. 4A - 4E the STB comprises the STB 60 of Figs. 1A - 1D, the representation of the section comprises an image, for example, a picture of a singer, and the 30 representation of the section is displayed on a display comprising the television display 20 of Figs. 1A - 1D.

Editing of the representation of the section via the STB is carried out by selecting a "CROP" option for getting a different rendering of the image. When the CROP option is selected, a proportional focus area of the image is determined, moved around the television display 20, and reduced or enlarged. Figs. 4C and 4E 5 show different renderings of the image resulting from different crops of the image. The different renderings of the image may, for example, be obtained through performance of additional snapshot transmission transactions that may be performed similarly to the first snapshot transmission transaction.

Reference is now made to Fig. 5, which is a simplified pictorial 10 illustration depicting editing of a representation of a section comprising a plurality of sub-sections. The representation of the section is preferably received in a snapshot transmission transaction.

The sub-sections typically cover an interval, such as an audio 15 interval or a video interval, having a beginning and an end. Editing of the representation of the section may thus include, for example, selecting only some of the plurality of sub-sections thus decreasing interval length. Selection of only some of the plurality of sub-sections may be performed by selectively adjusting a start sub-section and a stop sub-section of the section.

By way of example, which is not meant to be limiting, in Fig. 5 the 20 representation of the section comprises a polyphonic ring, the representation of the section is played on the mobile telephone 40 of Figs. 1A - 1D, and the editing of the representation of the section is performed on a display of the mobile telephone 40.

Preferably, a recording interval 190, and incrementing bars marked 25 "S" (for "start") and "E" (for "end") cutting the recording interval 190 are displayed on the display of the mobile telephone 40. Using, for example, keys, such as the conventional arrow keys 185 of the mobile telephone 40, the representation of the section may be edited by moving at least one of the incrementing bars S and E along the recording interval 190 to the left or to the right, thus selectively adjusting a start sub-section and a stop sub-section of the section.

It is appreciated that the bars S and E also provide an easy-to-read indication of a length of sub-section recording and may also indicate that the sub-section recording has started.

5 A similar recording interval and similar incrementing bars S and E may be used in editing of the representation of the section in a case where the representation of the section comprises a plurality of images. In such a case, however, the recording interval and the bars S and E may, for example, be displayed in an overlay overlaid over the images.

10 If the mobile telephone 40 has a capability of implementing editing changes to the polyphonic ring or the plurality of images, the editing changes are preferably implemented by the mobile telephone 40 once editing is terminated. However, if the mobile telephone 40 does not have the capability of implementing editing changes, additional snapshot transmission transactions are preferably conducted, similarly to the snapshot transmission transaction, in order to 15 implement the editing changes.

Reference is now made to Fig. 6, which is a simplified partly pictorial, partly block diagram illustration of a preferred implementation of the apparatus 10 of Figs. 1A - 1D including headend and broadcaster elements that are not shown in Figs. 1A - 1D. The apparatus 10 and the headend and broadcaster elements are 20 shown in Fig. 6 as parts of a system 200 for transmitting a representation of a section from a streamed digital broadcast program.

Preferably, the system 200 includes the following elements: a user selection unit; an identifier unit 230; and a transmitting unit 240.

25 The user selection unit may, for example, include a remote control controlling operation of an STB, such as, for example, the RC 50 that controls operation of the STB 60 of Figs. 1A - 1D. The RC 50 preferably enables selection, in a snapshot selection mode, of a section substantially when the section is rendered by the STB 60 on the television display 20 of Figs. 1A - 1D.

30 The identifier unit 230 preferably identifies the section based on a time at which the section was snapshot-selected with respect to rendering progress of the streamed digital broadcast program on the television display 20. The

identifier unit 230 preferably includes an application server. The application server 230 is preferably operatively associated with a section database 250 which is also preferably comprised in the system 200. The section database 250 is preferably operatively associated with a section recorder element 260 indicated "iCapture" 5 that is also preferably comprised in the system 200. The application server 230 is preferably operatively associated with the STB 60 via a return path interface 270 comprising, for example, a modem.

The transmitting unit 240 preferably transmits a representation of the section to an external device. By way of example, which is not meant to be 10 limiting, the transmitting unit 240 includes a mobile delivery system, and the external device includes the mobile telephone 40 of Figs. 1A - 1D. It is however appreciated that the external device may alternatively include any other appropriate external device as mentioned above with reference to Figs. 1A - 1D.

The system 200 also preferably includes broadcaster elements 15 comprising the following: a broadcast streaming device 280; and a scheduling system 290. The system 200 further preferably includes headend elements comprising the following: a data preparation unit 300; and a headend streaming device 310.

It is appreciated that the broadcaster elements, the headend elements, 20 the iCapture element 260, the section database 250, and the application server 230 may, for example, be all comprised in a headend.

The headend streaming device 310 is preferably operatively associated with the following elements: the broadcast streaming device 280; the data preparation unit 300; and the iCapture element 260. The broadcast streaming device 280 preferably provides the streamed digital program to the headend streaming device 310, and the headend streaming device 310 preferably broadcasts the streamed digital program to the STB 60, for example in an MPEG digital format. The headend streaming device 310 also preferably provides the streamed digital program to the iCapture element 260, preferably in the MPEG digital 30 format.

The iCapture element 260 is also preferably operatively associated with the following elements: the data preparation unit 300; and the scheduling system 290.

The iCapture element 260 preferably captures the streamed digital program, decodes the streamed digital program into a sequential series of discrete sections, and stores each of the discrete sections in the section database 250. The section database 250 is preferably sufficiently large to hold a significant history of sections. Preferably, the iCapture element 260 attaches to each section a UID that uniquely identifies the section for retrieval. A more detailed description of a preferred implementation of the iCapture element 260 is provided below with reference to Fig. 9.

It is appreciated that in the case where the streamed digital program is broadcast in the MPEG format, a required storage capacity of the section database 250 may be reduced if the iCapture element 260 is enabled to store in the section database 250 MPEG sequences in an MPEG format rather than discrete sections. An MPEG sequence is the smallest piece of an MPEG stream that can be decoded without any additional information. Storage of MPEG sequences is generally more economical than storage of discrete sections. Additionally, extraction of sections from an MPEG sequence is a fast and simple operation, and decoding of the MPEG sequence is relatively simple.

In order to operate on the streamed digital program which is provided in a digital format, such as the MPEG format, the iCapture element 260 preferably comprises elements that process a digital stream as described below with reference to Fig. 9. However, there are cases in which the headend streaming device 310 also broadcasts analog transmissions in an analog format, for example to user units (not shown) of one-way analog cable television systems (not shown). In such cases, the headend streaming device 310 may convert the streamed digital program into an analog stream and output the analog stream rather than a digital stream to the iCapture element 260. In order to operate on such an analog stream, the iCapture element 260 may alternatively comprise elements that process an analog stream as described below with reference to Fig. 10, and may output

discrete sections for storage in the section database 250 in a format that offers a good quality, such as, for example, the PNG format which is useful for image storage.

5 The application server 230 is preferably responsible for retrieving sections from the section database 250 in response to requests for snapshot-selected sections received from a user, such as, for example, the user 30 of Figs. 1A - 1D. The requests may preferably be provided to the application server 230 via the STB 60 and/or the mobile telephone 40 and the mobile delivery system 240.

10 Preferably, the application server 230 processes the requests and generates replies to the mobile telephone 40. The requests preferably include UIDs and the replies preferably include the corresponding sections. It is appreciated that the application server 230 may preferably support and serve requests from a plurality of users (not shown) simultaneously.

15 The replies are preferably transmitted through the mobile delivery system 240. The mobile delivery system 240 may also receive requests for additional sections from the mobile telephone 40 and provide the requests to the application server 230. The mobile delivery system 240 may further receive editing values of section parameters that result from editing operations and provide the editing values to the application server 230.

20 The requests may be transmitted in various methods. In a first method, a UID may be transmitted via the return path interface 270 of the STB 60, for example together with a specified telephone number for which a corresponding snapshot-selected section is intended, such as, for example, a telephone number of the mobile telephone 40. Transmission via the return path interface 270 does not typically involve user intervention. However, in a case where, for example, communication latency is high, transmission via the return path interface 270 may not be practical.

25 In a second method, the UID is preferably displayed on the television display 20 together with a message inviting the user 30 to send a text message, for example an SMS message including the UID to the application server 230. The application server 230 may then preferably return a representation of the

section having the corresponding UID. A disadvantage of using the second method is that typing errors or other human errors may be introduced during construction of the text message.

It is appreciated that the two methods may be combined so that by 5 default the return path interface 270 is used, but if an error occurs or the modem has not been connected, the user 30 is presented with a message on the television display 20 requesting the user 30 to send a text message with the UID.

Preferably, identification, by the identifier unit 230, of a section selected by the user 30 via the RC 50 may be performed in various identification 10 modes. Each identification mode ultimately translates a selection time of the section to a UID of a discrete section in the sequential series of discrete sections prepared by the iCapture element 260. It is appreciated that the identification of the section, in any identification mode, may be performed within an identification error range. The identification error range, in any identification mode, is typically 15 smaller than a typical inaccuracy range of selection of the section by the user 30.

By way of example, which is not meant to be limiting, the selected section referred to below comprises a single video frame, and the identifier unit 230 identifies the video frame from a sequential series of discrete video frames constructed by the iCapture element 260 from the streamed digital program 20 broadcasted in the MPEG digital format.

In a first identification mode, an identifier is preferably constructed based on a combination of values obtained from at least one of the following: a time code; a frame counter; and a discontinuation counter. The identifier is preferably comprised in the UID.

25 The time code is typically an integral part of a conventional MPEG stream. The time code is attached approximately every 1/2 second.

The frame counter specifies how many video frames have passed since the latest change in the time code was detected. The frame counter may 30 preferably be implemented by monitoring time codes in the STB 60 when the streamed digital program is displayed on the television display 20.

Preferably, the latest received time code is inspected once every 1/25 second. If a new time code is found, it is stored and the frame counter is set to zero. If the same time code is received again, the frame counter is incremented. A similar computation of the frame counter is preferably performed by the iCapture element 260.

The frame counter is based on a clock of the STB 60. There is a risk that the clock of the STB 60 may drift slightly so that the video frame cannot be exactly identified. However, latency in a reaction time of the user 30 selecting the video frame is typically much higher than such a drift and therefore the drift of the clock of the STB 60 is typically acceptable.

The combination of the time code and the frame counter is not always sufficient to make a complete unique identification of the video frame because the time code may have discontinuities. Discontinuities may be caused, for example, by changing or rebooting of MPEG encoding equipment (not shown) in any of the headend elements, and/or if pieces of pre-encoded MPEG material are comprised in the broadcasted streamed digital program.

The discontinuities may, for example, cause two different frames to have the same time code. In order to distinguish between two different frames having the same time code, discontinuities may preferably be counted in a discontinuation counter in both the iCapture element 260 and the STB 60. The discontinuation counter is preferably incremented each time a time code in the broadcasted streamed digital program is not continuous.

In order not to interfere with regular channel changing at the STB 60, the iCapture element 260 preferably broadcasts a current discontinuation counter value on a separate data stream encoded, for example and without limiting the generality of the present invention, as a document in bDOM (broadcast Document Object Model) which is commercially available from NDS Ltd., One London Road, Staines, Middlesex TW18 4EX, United Kingdom. The identifier comprised in the UID may thus also comprise an identifier that is partially based upon discontinuation counter information derived from a received broadcast transmission.

It is appreciated that the discontinuation counter value may be broadcast encoded as a document in bDOM because if a discontinuity occurs it is preferred to inform the STB 60 quickly of the discontinuity and bDOM is an appropriate candidate for informing the STB 60 of the discontinuity because 5 bDOM has a feature that enables transmission of information to STBs quickly. It is however appreciated that another appropriate encoding of the discontinuation counter value may alternatively be used.

After a period of monitoring the discontinuation counter and time codes being broadcast, the STB 60 is typically fully synchronized with the 10 application server 230 and the video frame may be uniquely identified.

Alternatively, the headend streaming device 310 and the iCapture element 260 associated therewith may be configured such that discontinuities will occur with negligible frequency. For example, the time code may be taken from a headend clock (not shown) rather than from material being broadcast, and the 15 headend streaming device 310 may have appropriate redundancy measures that enable high availability, as is well-known in the art. In such a case, counting the discontinuities in both the iCapture element 260 and the STB 60 is optional.

A second identification mode may be used in cases where the first identification mode is not viable, for example due to limitations in headend 20 equipment or STB middleware.

The second identification mode is particularly useful in a case where the streamed digital program may be broadcast with a constant and fixed broadcast latency. STBs useful for such a case may include any appropriate STBs such as, for example and without limiting the generality of the invention, STBs of a Media 25 Highway™ system, which is commercially available from NDS Limited, One London Road, Staines, Middlesex, TW18 4EX, United Kingdom.

In such a case, a unique number may be broadcast from the iCapture element 260 to the STB 60 which, for example, comprises a Media Highway™ STB. Since the broadcast latency is constant, the STB 60 is able to compute when the 30 number was sent from the iCapture element 260. The STB 60 may therefore compute a unique identification based on the latest received number and a time that

has passed since the latest received number was received. Identical computations can also be performed by the iCapture element 260, and it is therefore possible to compare results of such computations for correct identification of a snapped section.

It is appreciated that in the cases where the iCapture element 260 receives an analog stream rather than a digital stream from the headend streaming device 310, the data preparation unit 300 is optional and the identification of the video frame may be performed in another identification mode that is based on an identifier derived from time information provided by a conventional external clock (not shown) as described below with reference to Fig. 7.

10 The video frame is preferably selected by the user 30 via a user interface that interfaces with the STB 60. The user interface preferably includes the RC 50 and menu screens (not shown) on the television display 20. The menu screens enable the user 30 to perform the following operations: load the snapshot selection mode; input a target telephone number; and select a section from the streamed 15 digital broadcast program rendered on the display 20. Selections from the menu screens may, for example, be performed by pressing appropriate keys on the RC 50.

After selection of the video frame, the user 30 may also use the menu screens to approve the selection and a payment, and to allow the selection to be transmitted to the application server 230.

20 It is appreciated that in a section comprising a plurality of video frames, a start sub-section and a stop sub-section are preferably identified and identification of each of the start sub-section and the stop sub-section is preferably performed similarly to identification of the single video frame. A section comprising audio, such as a section comprising a tune, may be identified similarly to a section 25 comprising a plurality of video frames.

Reference is now made to Fig. 7, which is a simplified partly pictorial, partly block diagram illustration of a preferred implementation of the apparatus 100 of Figs. 2A and 2B including headend and broadcaster elements that are not shown in Figs. 2A and 2B. The apparatus 100 and the headend and broadcaster elements 30 are shown in Fig. 7 as parts of a system 400 for transmitting a representation of a section from a streamed broadcast program rendered on the television display 110 of

Figs. 2A and 2B. The streamed broadcast program may include an analog program or a digital program.

By way of example, which is not meant to be limiting, the streamed broadcast program mentioned with reference to Fig. 7 comprises a streamed analog program, and the section, which is preferably derived from the analog program, is also analog in form. It is however appreciated that the streamed broadcast program may alternatively comprise a streamed digital program.

Preferably, the system 400 includes the following elements: a user selection unit comprising, for example, the mobile telephone 130 of Figs. 2A and 10 2B; an identifier unit 410; and a transmitting unit 420.

In the system 400, the mobile telephone 130 is preferably used to enable selection, in a snapshot selection mode, of a section substantially when the section is rendered on the television display 110.

The identifier unit 410 is preferably similar in structure and function 15 to the identifier unit 230 of Fig. 6, and similarly includes an application server. The transmitting unit 420 is preferably similar in structure and function to the transmitting unit 240 of Fig. 6, and similarly includes a mobile delivery system. The transmitting unit 420 preferably transmits a representation of the section to the mobile telephone 130. The mobile telephone 130 thus serves, in the system 400, as 20 both a user selection unit and a target external device to which the representation of the section is transmitted.

Similarly to the system 200 of Fig. 6, the system 400 also preferably includes a section database 430 and a section recorder element 440 indicated 25 "iCapture". Preferably, the iCapture element 440 comprises elements that process a digital stream as described below with reference to Fig. 9, in which case streamed sections inputted to the iCapture element 440 are preferably in a digital format, such as, for example, an MPEG format. Alternatively, the iCapture element 440 comprises elements that process an analog stream as described below with reference to Fig. 10, in which case streamed sections inputted to the iCapture 30 element 440 are preferably in an analog format.

The section database 430 is preferably operatively associated with the iCapture element 440 and the application server 410. Preferably, the iCapture element 440 captures the streamed program, decodes the streamed program into a sequential series of discrete sections, and stores each of the discrete sections in the 5 section database 430. In a case where the iCapture element 440 comprises elements that process a digital stream and streamed sections inputted to the iCapture element 440 are in a digital format, the iCapture element 440 preferably stores in the section database 430 discrete sections in the digital format or MPEG sequences in a case where the digital format comprises an MPEG format. In a case 10 where the iCapture element 440 comprises elements that process an analog stream and streamed sections inputted to the iCapture element 440 are in an analog format, the iCapture element 440 preferably stores in the section database 430 discrete sections in a format that offers a good quality, such as, for example, the PNG format which is useful for image storage.

15 It is appreciated that the section database 430 is preferably sufficiently large to hold a significant history of sections. Preferably, the iCapture element 440 attaches to each section a UID that uniquely identifies the section for retrieval. It is appreciated that attachment of UIDs is based on a conventional external clock (not shown) that is used to identify when the iCapture element 440 20 has received sections. A more detailed description of a preferred implementation of the iCapture element 440 is provided below with reference to Fig. 10.

The system 400 also preferably includes broadcaster elements comprising the following: a broadcast streaming device 460; and a scheduling system 470. The system 400 further preferably includes a headend element 25 comprising a headend streaming device 480. The headend streaming device 480 is preferably operatively associated with the broadcast streaming device 460 and the iCapture element 440. The iCapture element 440 is also operatively associated with the scheduling system 470. The headend streaming device 480 preferably broadcasts the streamed program and also provides the streamed program to the 30 iCapture element 440 in the digital format or in the analog format.

It is appreciated that the broadcaster elements, the headend element, the iCapture element 440, the section database 430, and the application server 410 may, for example, be all comprised in a headend.

Preferably, a user interface in the system 400 enables selection of the 5 section by a user, such as, for example, the user 120 of Figs. 2A and 2B. The user interface preferably includes a VRS 450 and the mobile telephone 130. The VRS 450 is preferably operatively associated with the application server 410, and with the mobile telephone 130 via, for example, a cellular communication link. The VRS 450 may be implemented in any appropriate combination of hardware and 10 software, and may, for example, comprise a conventional voice response system that directs a telephone user to different menu options in response to the telephone user pressing on different telephone keys.

The application server 410 is preferably responsible for retrieving 15 sections from the section database 430 in response to requests for snapshot-selected sections received from the user 120. The requests may preferably be provided to the application server 410 via the mobile telephone 130 and the VRS 450 and/or via the mobile telephone 130 and the mobile delivery system 420.

Preferably, the application server 410 processes the requests and generates replies to the mobile telephone 130. The requests preferably include 20 UIDs and the replies preferably include the corresponding sections. It is appreciated that the application server 410 may preferably support and serve requests from a plurality of users (not shown) simultaneously.

The replies are preferably transmitted through the mobile delivery system 420. The mobile delivery system 420 or the VRS 450 may also receive 25 requests for additional sections from the mobile telephone 130 and provide the requests to the application server 410. The mobile delivery system 420 may further receive from the mobile telephone 130 editing values of section parameters that result from editing operations and provide the editing values to the application server 410.

30 As in the system 200 of Fig. 6, identification of a section selected by the user 120 ultimately translates a selection time of the section to a UID of a

discrete section in the sequential series of discrete sections. However, in the system 400 the VRS 450 transmits the UID to the application server 410.

By way of example, which is not meant to be limiting, the selected section referred to below comprises a single video frame which is selected in an 5 analog snapshot service from the streamed analog program which is rendered on the television display 110.

Preferably, the user 120 selects the video frame by pressing a key on the mobile telephone 130 substantially when the video frame is rendered on the television display 110. Identification of the video frame is based upon an identifier 10 derived from time information provided by a conventional external clock (not shown). The identifier may preferably be produced in the VRS 450 that also preferably generates and records a determination of a selection time representing the time at which selection of the video frame was carried out within a rendering period of the streamed analog program on the television display 110. After the 15 selection time is determined, the corresponding video frame may be found and retrieved from the section database 430. It is appreciated that the selection time may, if necessary, be adjusted based on a computed broadcast latency.

It is appreciated that the identification of the video frame may be performed within an identification error range. The identification error range is 20 typically smaller than a typical inaccuracy range of the selection of the video frame by the user 120.

It is further appreciated that in a section comprising a plurality of video frames, a start sub-section and a stop sub-section are preferably identified and 25 identification of each of the start sub-section and the stop sub-section is preferably performed similarly to identification of the single video frame. A section comprising audio, such as a section comprising a tune, may be identified similarly to a section comprising a plurality of video frames.

Preferably, the VRS 450 is accessed by the user 120 dialing a telephone number of the VRS 450 which is provided by a provider of the analog 30 snapshot service. The telephone number of the VRS 450 may preferably be

advertised and displayed on the television display 110 when the analog snapshot service is made available.

The VRS 450 preferably responds to a telephone call initiated by the user 120 by presenting the analog snapshot service. The user 120 may also be 5 requested to enter user input information including, for example, one or more of the following: a telephone number of the mobile telephone 130; a source of a video signal received at the television display 110; a type of the mobile telephone 130; an indication indicating a mobile operator that provides cellular services for the mobile telephone 130; and a target mobile telephone number. It is appreciated that 10 at least some of the user input information may be optional, such as, for example, the type of the mobile telephone 130 if the type can be autodetected.

It is appreciated that much of the user input information mentioned above may be provided once in a pre-registration as mentioned above, and stored at the VRS 450 for future sessions of snapshot transmission.

15 After accepting and processing the user input information, the VRS 450 may notify the user 120 that it is ready to accept a selection of a desired image from the streamed analog program which is rendered on the television display 110. The VRS 450 then preferably invites the user 120 to press a key on a keypad of the mobile telephone 130 when the user 120 notes a desired image on the television 20 display 110.

25 Preferably, when the VRS 450 detects that the user 120 has pressed the key on the keypad of the mobile telephone 130, the VRS 450 generates a request with an indication signal comprising the selection time. Based on the selection time, it is possible to locate a video frame comprising the image as mentioned above.

It is appreciated that rights of information owners may be treated in similar ways in the system 200 of Fig. 6 and the system 400 of Fig. 7. Broadcasters that are also owners of content information that is subject to transmission as snapshots may charge users for taking snapshots of their own content. For broadcast 30 material whose rights are not owned by the broadcasters, agreements may, for example, be made in which either the rights for offering the material are acquired by

the broadcasters, or revenues from snapshot transmissions are split between owners of the rights and the broadcasters. Each program offered in a snapshot service may preferably include a code identifying a rights owner that may be entitled to at least a portion of payments made by users obtaining snapshots from the program.

5 It is appreciated that if a program is not offered in the snapshot service, the program may be assigned a metadata code that prevents taking and transmitting snapshots thus "turning off" the snapshot service for the program. Such "censoring" of the snapshot service is typically done by the scheduling system 290 of Fig. 6 and the scheduling system 470 of Fig. 7, respectively.

10 The metadata code may also be useful in billing users for snapshot transmissions because the metadata code identifies a streamed program from which the snapshots are taken. Identification of the program through the metadata code enables the snapshot service to credit a rights owner as mentioned above. Preferably, metadata associated with programs also includes different snapshot pricing indications, for example through metadata tags. The different snapshot pricing indications may preferably be presented to the users before they submit requests for snapshot transmissions.

15 It is appreciated that two matters are preferably addressed in order to achieve negligible inaccuracies in identification of correct snapshot sections in the system 400 of Fig. 7 operating with any of a streamed analog program and a streamed digital program. The first matter addressed is synchronization among clocks of all sub-systems that are involved in a determination of a selection time of a section. The second matter addressed is possible latencies in the sub-systems. Preferably, in order to take the two matters into account, identification of the section 20 includes performance of computations correcting at least one of the following: synchronization inaccuracies in at least one clock of at least one sub-system that is involved in computation of the selection time; and effect of latencies in the at least one sub-system.

25 The synchronization among the clocks of the sub-systems may be obtained by employing a computation mechanism, such as a clock synchronization software mechanism, for synchronizing the sub-systems clocks. An example of

such a mechanism is the Network Time Protocol (NTP) software which is described at the World Wide Web site www.ntp.org, the disclosure of which is hereby incorporated herein by reference.

5 In order to take latencies into account, at least some of the latencies in the sub-systems may be determined in advance. It is appreciated that at least some of the latencies are believed to be fairly constant over time, and constant for most users. Any remaining variance in such latencies is believed to be small and without significant influence on end results.

10 The following sub-systems are expected to contribute latencies in the system 400: telephone connections and the VRS 450; broadcast sub-systems; and the iCapture element 440.

15 The latencies contributed by the telephone connections and the VRS 450 are expected to be insignificant because telephone systems and VRSs are designed a priori to successfully handle voice interaction and selections through key presses.

If the VRS 450 involves a network connection between hardware that handles telephone calls and a computer that is able to compute the selection time, the network connection may contribute network latency. If the network latency is fairly constant, the network latency may be measured and subtracted. 20 Networks, however, have a tendency to have a high variance in latencies if and only if an amount of traffic passing in the networks is close to the maximal capacity. Thus, in order to avoid a high variance in latency, a network used for providing a snapshot service preferably has a traffic capacity larger than what is normally needed. If the network used for providing the snapshot service is to be 25 shared, it is important to ensure exclusive reservation of ample capacity of the network for the snapshot service.

Another latency that may be associated with the VRS 450 is related to whether the VRS 450 records a key press when the key is pressed down or when the key is released. In such a case, it is preferred, in terms of latency, to use a VRS 30 in which key presses are recorded when keys are pressed down.

Latencies of broadcast systems depend on how video signals are broadcast to users and to the iCapture element 440 which records the video signals. The video signals may, for example, be received at the iCapture element 440 at a different time than at the television display 110. If the iCapture element 440 receives the video signals from a source other than a source that broadcasts the video signals to the television display 110, it is possible to compute a resulting latency.

It is appreciated that a latency correction may, for example, be computed and entered if, for example, it is found from users' complaints that there is a consistent discrepancy between selected sections and sections actually being identified and transmitted. In such a case, computation of the latency correction may preferably include translating the discrepancy to a latency correction value.

If different sources, such as, for example, a cable source and a satellite transmission source, are used to provide video signals to different users, significant latencies in video reception may occur. In such a case, latencies of cable transmission and satellite transmission may be measured in advance and taken into account. It is appreciated that the user input information regarding a source of a video signal received at the television display 110 that is mentioned above is preferably used for taking such latencies into account.

Latency in the iCapture element 440 results from a difference between a time at which the streamed program is received and a computation time of the selection time. Such latency may be insignificant, or measured in advance and taken into account.

Reference is now made to Fig. 8, which is a simplified partly pictorial, partly block diagram illustration of a system 500 for providing a snapshot service in which there are various latencies. By way of example, the latencies refer to broadcast and reception of a streamed digital video signal in an MPEG format.

Preferably, a broadcaster headend 510 includes an iCapture element 520 and a video generation device 530 between which latency is, by way of example, zero. The video generation device 530 broadcasts, for example with broadcast latency A, an MPEG signal to an antenna 540. The antenna 540

transmits the MPEG signal to a communication satellite 550 with a latency B. A receiving antenna 560 receives the MPEG signal with a latency C, and thus a total latency at a user unit 570 is A+B+C.

It is appreciated that since a transmission coverage area of the satellite 550 is typically large, the latency C may differ depending on whether the antenna 540 is located at an edge of the transmission coverage area or at a center of the transmission coverage area. However, within a service area of, for example, a city or a county or a state, differences in latency C due to disparate locations of antennas are negligible. The transmission coverage area of the satellite 550 may therefore be divided into a plurality of such service areas, and the latency C for each such service area may be separately determined. The latency C by which the receiving antenna 560 receives the MPEG signal may be thus determined based on a service area within which the antenna 560 is located.

The video generation device 530 also broadcasts, for example with latency X, the MPEG signal to a cable network operator headend 580. The cable network operator headend 580 transmits the MPEG signal along a cable network that produces a latency Y. A total latency at a user unit 590 that is associated with the cable network is X+Y.

The latency Y may differ depending on a configuration of the cable network and distribution of user units in the cable network. However, within a service area of, for example, a local community or an urban quarter, differences in latency Y due to disparate locations of user units are negligible and the latency Y for each such service area may be separately determined. The total latency at the user unit 590 may be thus determined based on a service area within which the user unit 590 is located.

It is thus noted that although latencies in various transmission scenarios that may be used for providing a snapshot service may be different, it is possible to compute the latencies and to take them into account accordingly.

Reference is now made to Fig. 9, which is a simplified block diagram illustration of a preferred implementation of an iCapture element which is operative in either of the implementation depicted in Fig. 6 and the implementation

depicted in Fig. 7 in a configuration that is suitable for processing a digital stream. By way of example, which is not meant to be limiting, the iCapture element depicted in Fig. 9 and described with reference to Fig. 9 comprises the iCapture element 260 of Fig. 6 in a configuration that is suitable for processing a digital stream.

The iCapture element 260 in the configuration that is suitable for processing a digital stream preferably prepares a streamed program within a digital stream in a format suitable for transmission of discrete sections. The streamed program may preferably include a digital program comprising at least one of the following: an audio program; a video program; an A/V program; and a multimedia program.

By way of example, which is not meant to be limiting, the streamed program inputted to the iCapture element 260 in the configuration that is suitable for processing a digital stream comprises MPEG encoded digital video and the sections comprise video frames.

It is appreciated that the MPEG video is preferably inputted to the iCapture element 260 in a clear form. If the MPEG video was originally encrypted, a decrypter (not shown), as is well known in the art preferably decrypts the encrypted MPEG video prior to providing it to the iCapture element 260 so that the iCapture element 260 ultimately receives decrypted streaming MPEG video.

Preferably, the iCapture element 260 in the configuration that is suitable for processing a digital stream includes the following elements: a decoder 700; a UID control unit 710; and a database interface 720. The iCapture element 260 may also include a metadata control unit 730.

The decoder 700 preferably comprises an MPEG decoder which decodes the streamed program into a plurality of video frames. The MPEG decoder 700 preferably produces one output with a time code embedded in the video frames and one with still pictures. The MPEG decoder 700 also preferably ensures that exactly one picture is generated for each frame. Further preferably, the MPEG decoder 700 checks the MPEG video to determine whether there are portions of the MPEG video for which a snapshot service should not be allowed. For example,

the MPEG decoder 700 may decode the streamed program only if the streamed program is marked by a mark allowing transmission of discrete sections.

The MPEG decoder 700 also preferably divides the MPEG video into MPEG sequences for storage in a section database (not shown in Fig. 9).

5 Preferably, the MPEG decoder 700 provides time codes to the UID control unit 710.

The UID control unit 710 preferably associates a UID with each frame in the plurality of video frames. Preferably, association of UIDs is performed in synchronization with UIDs in applications running on STBs. The 10 UID control unit 710 preferably computes for each frame a time code of the frame and thus computes the UID. At the same time, the UID control unit 710 monitors time codes being broadcast to identify any discontinuities in the time codes. When a discontinuity occurs, a discontinuation counter is incremented.

The database interface 720 preferably enables storage in the section 15 database and retrieval from the section database of each of the plurality of video frames through reference to a UID so that it is possible to perform lookups and searches based on UIDs.

The metadata control unit 730 is preferably operative to receive 20 metadata from headend elements (not shown in Fig. 9), such as the data preparation unit 300 of Fig. 6, to process the metadata, and to dispatch the metadata, if necessary, to other elements (not shown). The metadata control unit 730 preferably has two responsibilities:

1. Responsibility for determining whether the snapshot service should be 25 available or not. Based on such a determination, the metadata control unit 730 preferably sends data to the headend elements, for example to the data preparation unit 300 of Fig. 6. The data controls the availability of the snapshot service and it is ultimately transmitted to the STBs; and
2. Responsibility for constructing a reference between UIDs and billing 30 information, that is creating a link between the UIDs and a specific rights owner.

It is appreciated that the metadata control unit 730 may receive, for example from the data preparation unit 300 of Fig. 6, metadata tags referring to a set of preferred sections representing the best frames of the plurality of video frames, and assign the metadata tags to the preferred sections upon storage in the 5 section database. The set of preferred sections may, for example, be prepared by a headend operator (not shown).

If the iCapture element 260 receives a digital signal in a format other than MPEG as input, computation of UIDs cannot be made using time codes because time codes are specific to MPEG. In such a case, the MPEG decoder 700 10 is preferably replaced by another appropriate decoder that is capable of decoding the format other than MPEG and generating still pictures from such a format. The decoder that is capable of decoding the format other than MPEG also preferably provides timing information other than time codes to the UID control unit 710, where the timing information may be used as a basis for computing the UIDs.

15 Reference is now made to Fig. 10, which is a simplified block diagram illustration of a preferred implementation of an iCapture element which is operative in either of the implementation depicted in Fig. 6 and the implementation depicted in Fig. 7 in a configuration that is suitable for processing an analog stream. By way of example, which is not meant to be limiting, the iCapture element depicted 20 in Fig. 10 and described with reference to Fig. 10 comprises the iCapture element 440 of Fig. 7 in a configuration that is suitable for processing an analog stream.

The iCapture element 440 in the configuration that is suitable for processing an analog stream preferably prepares a streamed analog program within an analog stream in a format suitable for transmission of discrete sections. The 25 streamed analog program preferably includes at least one of the following: an audio program; a video program; an A/V program; and a multimedia program.

By way of example, which is not meant to be limiting, the streamed analog program inputted to the iCapture element 440 in the configuration that is suitable for processing an analog stream comprises encoded analog video which is 30 received, for example, from the headend streaming device 480 of Fig. 7, and the sections comprise video frames.

Preferably, the iCapture element 440 in the configuration that is suitable for processing an analog stream includes the following elements: an analog frame decoder 800; a UID control unit 810; an image converter 820; and a database interface 830. The iCapture element 440 may also include a metadata control unit 840. The database interface 830 preferably interfaces to a section database (not shown in Fig. 10).

The analog frame decoder 800 is preferably responsible for decoding inputted analog video into a plurality of video frames and for preparing the frames of the analog video for storage in the section database.

The image converter 820 preferably converts the video frames from a format outputted from the analog frame decoder 800 into, for example, a format best suitable for display on mobile telephones. For example, format conversion may be performed to change picture sizes to sizes acceptable on the mobile telephones.

The UID control unit 810 preferably determines UIDs based on, for example, either frame timing information provided by the analog frame decoder 800 or an input provided by an external clock. The UID control unit 810 also preferably associates, in synchronization, a UID with each video frame in the plurality of video frames.

The database interface 830 and the metadata control unit 840 may be similar to the database interface 720 of Fig. 9 and the metadata control unit 730 of Fig. 9, respectively.

It is appreciated that the iCapture element 260 of Fig. 9 and the iCapture element 440 of Fig. 10 may alternatively be comprised in a combined architecture (not shown) for dealing with both digital video and analog video.

Reference is now made to Fig. 11, which is a simplified flowchart illustration of a preferred method of operation of any of the apparatus 10 of Figs. 1A - 1D and the apparatus 100 of Figs. 2A and 2B. The method of Fig. 11 is self-explanatory.

Reference is now made to Fig. 12, which is a simplified flowchart illustration of a preferred method of operation of any of the apparatus depicted in

Fig. 6 and the apparatus depicted in Fig. 7. The method of Fig. 12 is self-explanatory.

Reference is now made to Fig. 13, which is a simplified flowchart illustration of a preferred method of operation of any of the iCapture element 260 of Fig. 9 and the iCapture element 440 of Fig. 10. The method of Fig. 13 preferably comprises the following steps:

10 A streamed program is decoded (step 1000) into a plurality of discrete sections in preparation for preparing the streamed program in a format suitable for transmission of discrete sections. A UID is associated (step 1010), in synchronization, with each discrete section in the plurality of discrete sections, and storage and retrieval of each of the plurality of discrete sections is enabled (step 1020) through reference to a UID.

15 It is appreciated that various features of the invention which are, for clarity, described in the contexts of separate embodiments may also be provided in combination in a single embodiment. Conversely, various features of the invention which are, for brevity, described in the context of a single embodiment may also be provided separately or in any suitable subcombination.

20 It will be appreciated by persons skilled in the art that the present invention is not limited by what has been particularly shown and described hereinabove. Rather the scope of the invention is defined by the claims which follow:

What is claimed is:

CLAIMS

1. A method for selecting a section from a streamed broadcast program,
5 the method comprising:
receiving a streamed broadcast program;
rendering the received streamed broadcast program on a display;
selecting a section from the received streamed broadcast program
substantially when the section is rendered on the display; and
10 producing an indication signal which enables identification of the
section based on a time at which selection of the section was carried out with
respect to rendering progress of the streamed broadcast program on the display.
2. The method according to claim 1 and also comprising:
15 identifying the section based on the indication signal.
3. The method according to claim 2 and wherein said identifying
comprises:
20 computing, based on the indication signal, a selection time
representing the time at which the selection of the section was carried out within a
rendering period of the streamed broadcast program on the display; and
recognizing the section as a discrete section which, in a sequential
series of discrete sections constructed from the streamed broadcast program,
corresponds to the selection time.
- 25 4. The method according to claim 3 and wherein each of the sections in
the sequential series of discrete sections is tagged with a unique identification
(UID), and the recognizing comprises determining a UID of the discrete section.
- 30 5. The method according to any of claims 2 - 4 and also comprising:

transmitting, in response to the identifying, a representation of the section to at least one of the following: an external device; and an external medium.

5 6. The method according to claim 5 and wherein the representation of the section comprises one of the following: the section formatted in a format that is suitable for rendering on a rendering device; metadata related to the section; and the section formatted in a format that is suitable for rendering on a rendering device and associated with metadata related to the section.

10 7. The method according to any of claims 2 - 4 and also comprising: finding, in response to the identifying, a replacement section that relates to the section; and transmitting a representation of the replacement section to at least 15 one of the following: an external device; and an external medium.

8. The method according to claim 5 and wherein the external device comprises at least one of the following: a mobile telephone; a computing device; an entertainment device; a printer; and a communication device.

20 9. The method according to claim 5 and wherein the external medium comprises at least one of the following: a medium in the external device; and a medium attached to the external device.

25 10. The method according to claim 5 and wherein the external medium comprises a memory stick.

11. The method according to claim 5 and also comprising receiving the representation of the section embedded in at least one of the following: a 30 Multimedia Messaging Service (MMS) message; a Wireless Application Protocol

(WAP) push message; a JAVA™ application; a Short Messaging Service (SMS) message; and an electronic-mail (e-mail) message.

12. The method according to claim 5 and wherein the representation of the section is suitable for at least one of the following: playing on the external device; displaying on the external device; editing via the external device; and transmitting to another external device.
13. The method according to claim 5 and also comprising:
 - 10 editing the representation of the section.
14. The method according to claim 13 and wherein the editing comprises at least one of the following: cropping a displayed area of the representation of the section; reducing a displayed area of the representation of the section; and
15 enlarging a displayed area of the representation of the section.
15. The method according to claim 13 and also comprising returning editing values of section parameters in response to the editing.
- 20 16. The method according to claim 15 and wherein the returning comprises returning the editing values to a server.
17. The method according to claim 16 and wherein the server is associated with a headend.
- 25 18. The method according to claim 16 and wherein the server is comprised in a headend.
19. The method according to claim 15 and wherein the editing values
30 comprise at least one of the following: picture display coordinates; picture size

information; information regarding picture elements positions; and audio parameters.

20. The method according to claim 15 and also comprising:
5 processing the representation of the section and the editing values to produce a result comprising at least one of the following: an edited representation of the section; and a representation of a new section; and transmitting the result, in response to the processing, to at least one of the external device and the external medium.

10
15 21. The method according to claim 5 and also comprising:
transmitting a request to receive at least one of the following: a representation of a section preceding the section in the streamed broadcast program; and a representation of a section following the section in the streamed broadcast program.

22. The method according to any of claims 1 - 4 and wherein the section comprises at least one of the following: an audio section; a video section; an audio and video (A/V) section; and a multimedia section.

20
25 23. The method according to any of claims 1 - 4 and wherein the section comprises at least one of the following: a video frame; at least a portion of a tune; at least a portion of a video clip; at least a portion of an audio program; and at least a portion of a television program.

24. The method according to any of claims 1 - 4 and wherein the streamed broadcast program comprises at least one of the following: a streamed audio program; a streamed video program; a streamed A/V program; and a streamed multimedia program.

30

25. The method according to any of claims 1 - 4 and wherein the streamed broadcast program comprises at least one of the following: a television program; an audio program; a video clip; an interactive television program; a multimedia program; and a multimedia presentation.

5

26. The method according to any of claims 2 - 4 and wherein the identifying comprises identifying the section within an identification error range.

27. The method according to claim 3 or claim 4 and wherein:
10 the streamed broadcast program comprises an analog program;
the selecting comprises pressing a key on a telephone keypad; and
the computing comprises computing the selection time at a voice response system.

15 28. The method according to claim 27 and wherein the analog program comprises at least one of the following: an audio program; a video program; an A/V program; and a multimedia program.

29. The method according to claim 3 or claim 4 and wherein:
20 the streamed broadcast program comprises a digital program;
the selecting comprises pressing a key on a remote control (RC); and
the computing comprises computing the selection time at at least one of the following: a set-top box (STB); and a headend.

25 30. The method according to claim 29 and wherein the digital program comprises at least one of the following: an audio program; a video program; an A/V program; and a multimedia program.

31. The method according to any of claims 1 - 4 and wherein the
30 producing comprises producing the indication signal at an STB.

32. The method according to any of claims 1 - 4 and wherein the producing comprises producing the indication signal at a headend.

33. The method according to any of claims 1 - 4 and wherein the 5 producing comprises producing the indication signal at a voice response system.

34. The method according to any of claims 2 - 4 and wherein the identifying comprises identifying the section at at least one of the following: a headend; and an STB.

10 35. The method according to claim 1 and wherein the producing comprises producing the indication signal unless the streamed broadcast program is marked by a mark forbidding selection of the section.

15 36. The method according to claim 1 and wherein the producing comprises producing the indication signal only if the streamed broadcast program is marked by a mark allowing selection of the section.

37. The method according to claim 35 or claim 36 and wherein the mark 20 comprises a metadata code.

38. The method according to any of claims 1 - 4 and also comprising: generating, on the display, a visual effect in response to the selecting.

25 39. The method according to claim 38 and wherein the visual effect comprises at least one of the following: a flashy visual effect; a visual blitz effect; and a flashy visual blitz effect.

30 40. The method according to any of claims 1 - 4 and also comprising:

inviting a user to enter a device identification code identifying an external device to which to transmit a representation of the section.

41. The method according to claim 40 and wherein the inviting 5 comprises displaying, on the display, a message inviting the user to enter the device identification code.

42. The method according to claim 40 and wherein the inviting comprises playing a message inviting the user to enter the device identification 10 code.

43. The method according to claim 5 and wherein the transmitting comprises:

producing an indication of agreement by a user to pay for the 15 transmitting; and
transmitting the representation of the section in response to the producing.

44. The method according to claim 13 and wherein the editing comprises 20 editing the representation of the section via one of the following: the external device; and an STB.

45. The method according to any of claims 1 - 4 and also comprising, 25 prior to the selecting, inviting a user to select a desired section.

46. The method according to claim 45 and wherein the inviting comprises displaying a message inviting the user to select the desired section.

47. The method according to claim 45 and wherein the inviting 30 comprises playing a message inviting the user to select the desired section.

48. The method according to any of claims 1 - 4 and also comprising, prior to the selecting, accepting user input information comprising at least one of the following: a user's mobile telephone number; a source of a video signal received at one of the display and a user's STB; a user's mobile telephone type; an indication 5 indicating a mobile operator that provides cellular services for the user's mobile telephone; and a target mobile telephone number.

49. The method according to any of claims 1 - 4 and wherein the section comprises a plurality of sub-sections, and the selecting comprises selecting a start 10 sub-section and a stop sub-section from the plurality of sub-sections.

50. The method according to claim 49 and also comprising determining a timeout stop sub-section if the stop sub-section is not selected within a timeout period.

15 51. The method according to claim 49 and wherein the selecting comprises selecting the start sub-section by pressing on a first key of an input device, and selecting the stop sub-section by pressing on a second key of the input device.

20 52. The method according to claim 49 and wherein the selecting comprises selecting the start sub-section by pressing once on a key of an input device, and selecting the stop sub-section by pressing again on the key of the input device.

25 53. The method according to any of claims 1 - 4 and wherein the display comprises at least one of the following: a television; a monitor of a computing device; a display of a mobile telephone; a display of an entertainment device; and a display of a communication device.

54. The method according to claim 5 and wherein the transmitting comprises associating branding information identifying a provider of the section with the representation of the section.

5 55. The method according to claim 54 and wherein the branding information comprises an owner rights code.

56. The method according to claim 4 and wherein the UID comprises an identifier based on a combination of values obtained from at least one of the
10 following: a time code; a frame counter; and a discontinuation counter.

57. The method according to claim 4 and wherein the UID comprises an identifier derived from a received broadcast transmission.

15 58. The method according to claim 4 and wherein the UID comprises an identifier derived from time information provided by an external clock.

59. The method according to claim 3 or claim 4 and wherein the computing also comprises performing computations correcting at least one of the
20 following: synchronization inaccuracies in at least one clock of at least one sub-system that is involved in computation of the selection time; and effect of latencies in the at least one sub-system.

60. The method according to claim 4 and also comprising transmitting
25 the UID of the section via at least one of the following: a return path of an STB; a wired communication link; and a wireless communication link.

61. The method according to claim 3 or claim 4 and wherein the recognizing comprises:

30 finding a first preferred section and a second preferred section from a set of preferred sections representing the best sections of the sequential series of

discrete sections, the first preferred section being the nearest preferred section before the discrete section that corresponds to the selection time, and the second preferred section being the nearest preferred section after the discrete section that corresponds to the selection time; and

5 selecting the section as one of the first and the second preferred sections which is closer in the sequential series of discrete sections to the discrete section that corresponds to the selection time.

62. The method according to claim 61 and wherein the set of preferred
10 sections comprises predefined preferred sections.

63. The method according to claim 61 and wherein the selecting
 comprises selecting the section as one of the first and the second preferred sections
 in response to a determination of the streamed broadcast program as a preview.

15 64. The method according to claim 61 and also comprising enabling
 linked access to external information via the section.

65. A method for obtaining at an external device a representation of a
20 section, which section is obtained from a streamed broadcast program rendered on
 a display, the method comprising:

 selecting, in a snapshot selection mode, a section from the streamed
 broadcast program substantially when the section is rendered on the display;

25 26. identifying the section based on a time at which the section was
 snapshot-selected with respect to rendering progress of the streamed broadcast
 program on the display; and

 transmitting a representation of the section to the external device.

66. A method for preparing a streamed program in a format suitable for
30 transmission of discrete sections, the method comprising:
 decoding a streamed program into a plurality of discrete sections;

associating, in synchronization, a UID with each discrete section in the plurality of discrete sections; and

enabling storage and retrieval of each of the plurality of discrete sections through reference to a UID.

5

67. The method according to claim 66 and wherein the streamed program comprises one of the following: an analog program; and a digital program.

10

68. The method according to claim 67 and wherein each of the analog program and the digital program comprises at least one of the following: an audio program; a video program; an A/V program; and a multimedia program.

15

69. The method according to any of claims 66 - 68 and also comprising: preparing a set of preferred sections representing the best sections of the plurality of discrete sections.

20

70. The method according to any of claims 66 - 68 and wherein the decoding comprises decoding the streamed program only if the streamed program is marked by a mark allowing transmission of discrete sections.

25

71. The method according to claim 66 and wherein: the streamed program comprises an MPEG encoded program; and the enabling comprises enabling storage of MPEG sequences.

72.

Apparatus for selecting a section from a streamed broadcast program, the apparatus comprising:

a receiving and rendering device receiving a streamed broadcast program and rendering the received streamed broadcast program on a display;

a user selection unit enabling selection of a section from the received streamed broadcast program substantially when the section is rendered on the display; and

5 a controller producing an indication signal which enables identification of the section based on a time at which selection of the section was carried out with respect to rendering progress of the streamed broadcast program on the display.

73. 10 A system for transmitting a representation of a section, which section is obtained from a streamed broadcast program rendered on a display, the system comprising:

15 a user selection unit enabling selection, in a snapshot selection mode, of a section from the streamed broadcast program substantially when the section is rendered on the display;

an identifier unit identifying the section based on a time at which the section was snapshot-selected with respect to rendering progress of the streamed broadcast program on the display; and

20 a transmitting unit transmitting a representation of the section to an external device.

74. 25 Apparatus for preparing a streamed program in a format suitable for transmission of discrete sections, the apparatus comprising:

a decoder decoding a streamed program into a plurality of discrete sections;

25 a unique identification (UID) control unit associating, in synchronization, a UID with each discrete section in the plurality of discrete sections; and

30 a database interface enabling storage in a section database and retrieval from the section database of each of the plurality of discrete sections through reference to a UID.

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Soren [DK/DK]; Englandsvej 16, 4 th, DK-2300 Kobenhavn S (DK). PRAEST, Peter [DK/DK]; Frankrigsgade 31, 4 th, DK-2300 Kobenhavn S (DK). DARSHAN, Ezra [IL/IL]; 15B HaHavatzelet Street, 99590 Beit Shemesh (IL).

(21) International Application Number: PCT/IL2004/000466

(74) Agents: SANFORD T. COLB & CO. et al.; P.O. Box 2273, 76122 Rehovot (IL).



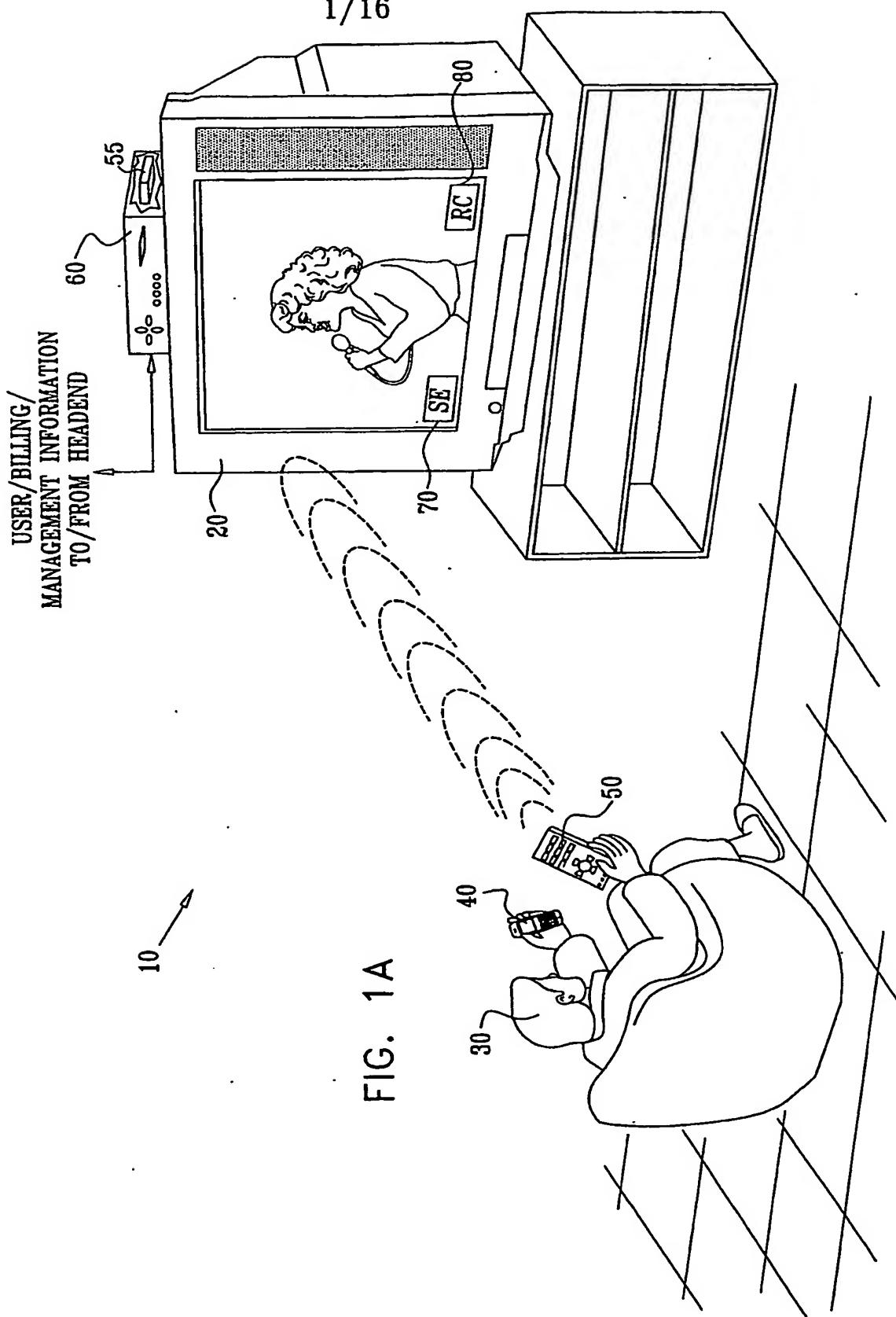
SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,
GW, ML, MR, NE, SN, TD, TG).

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

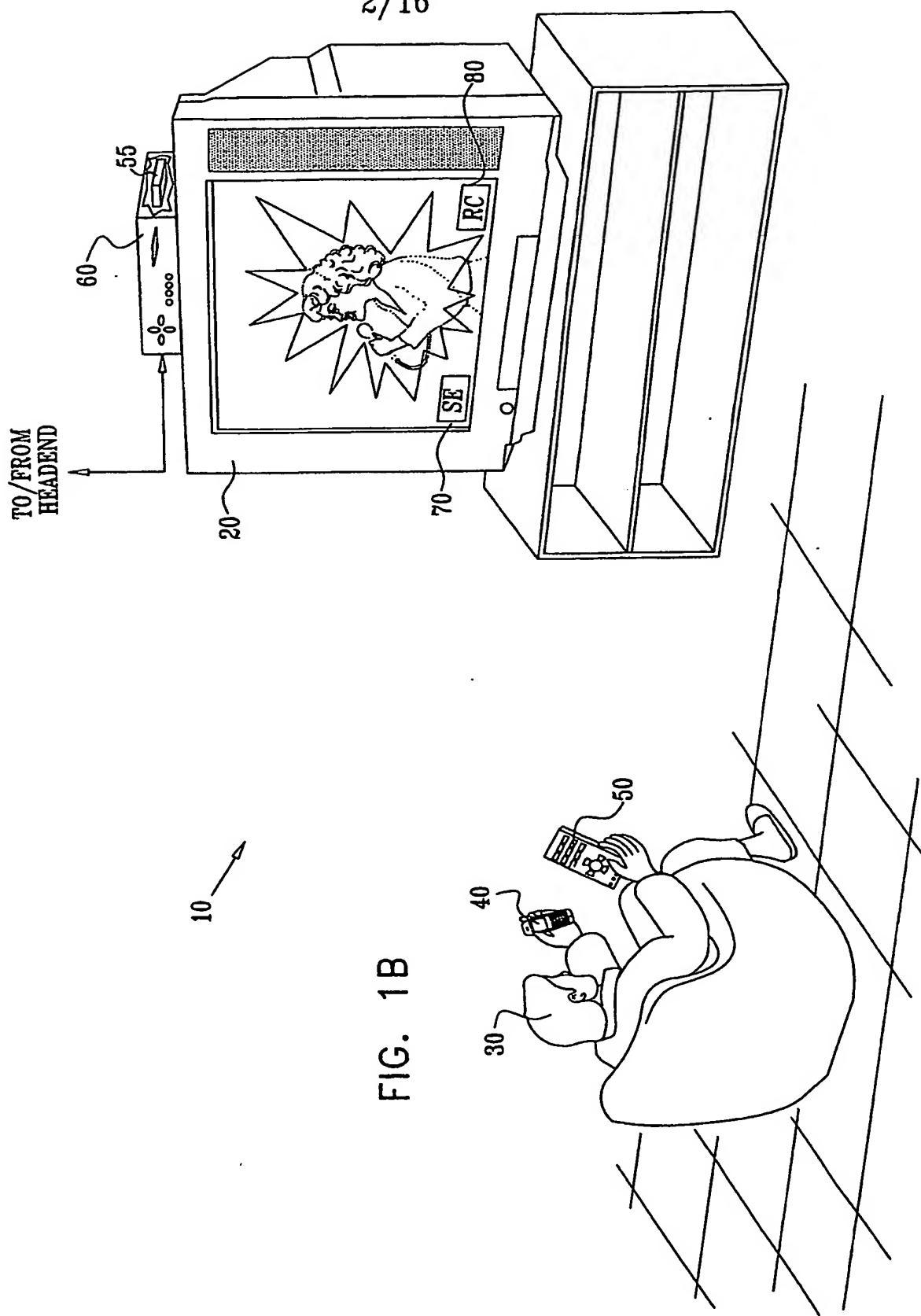
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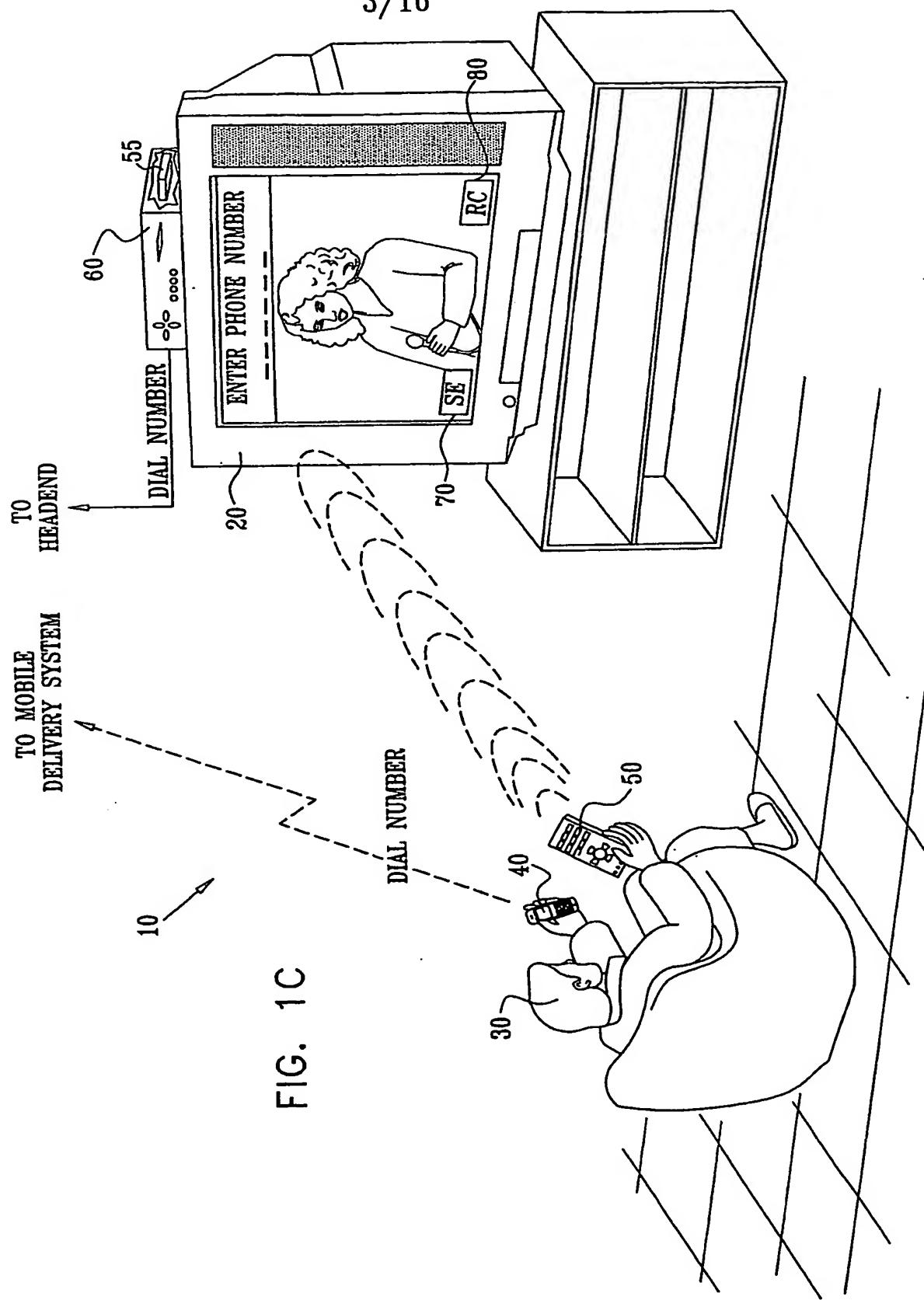
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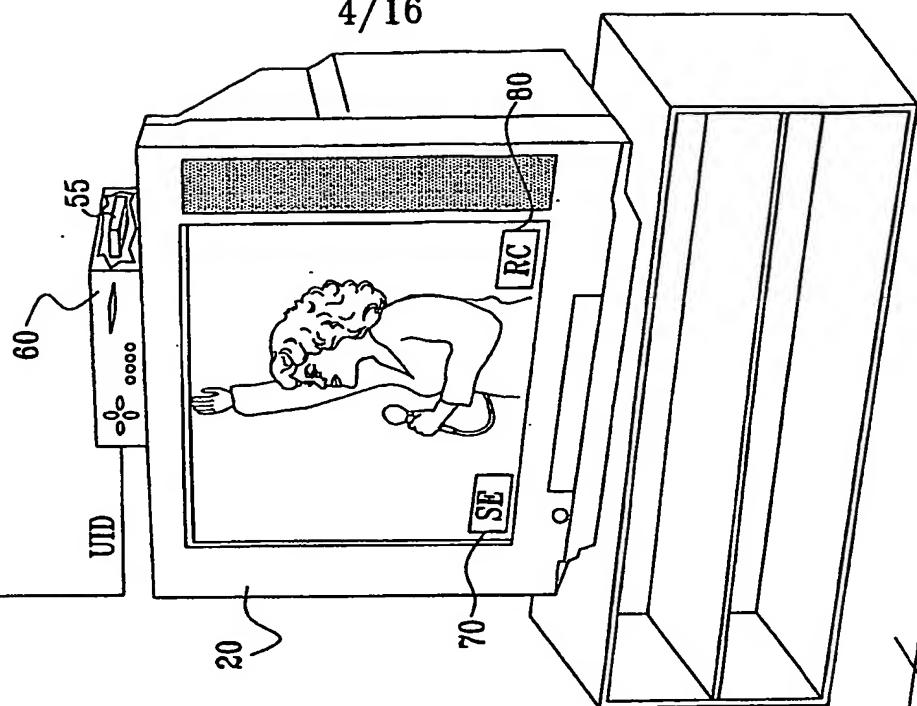


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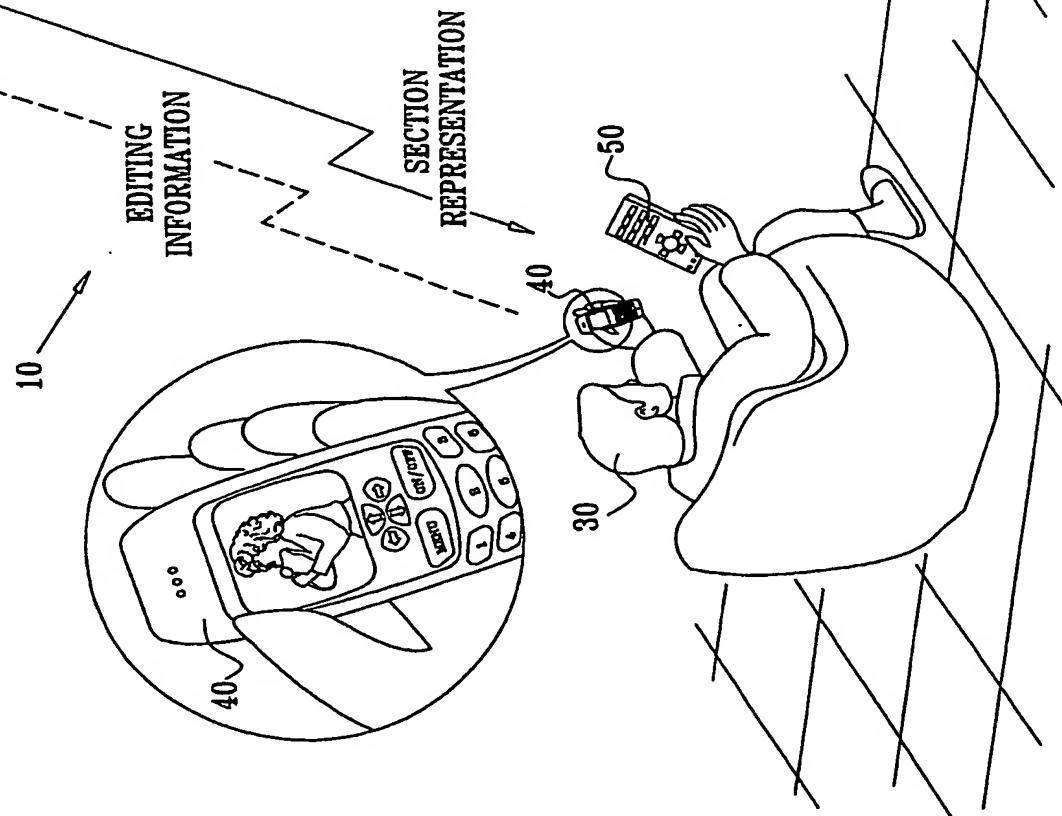


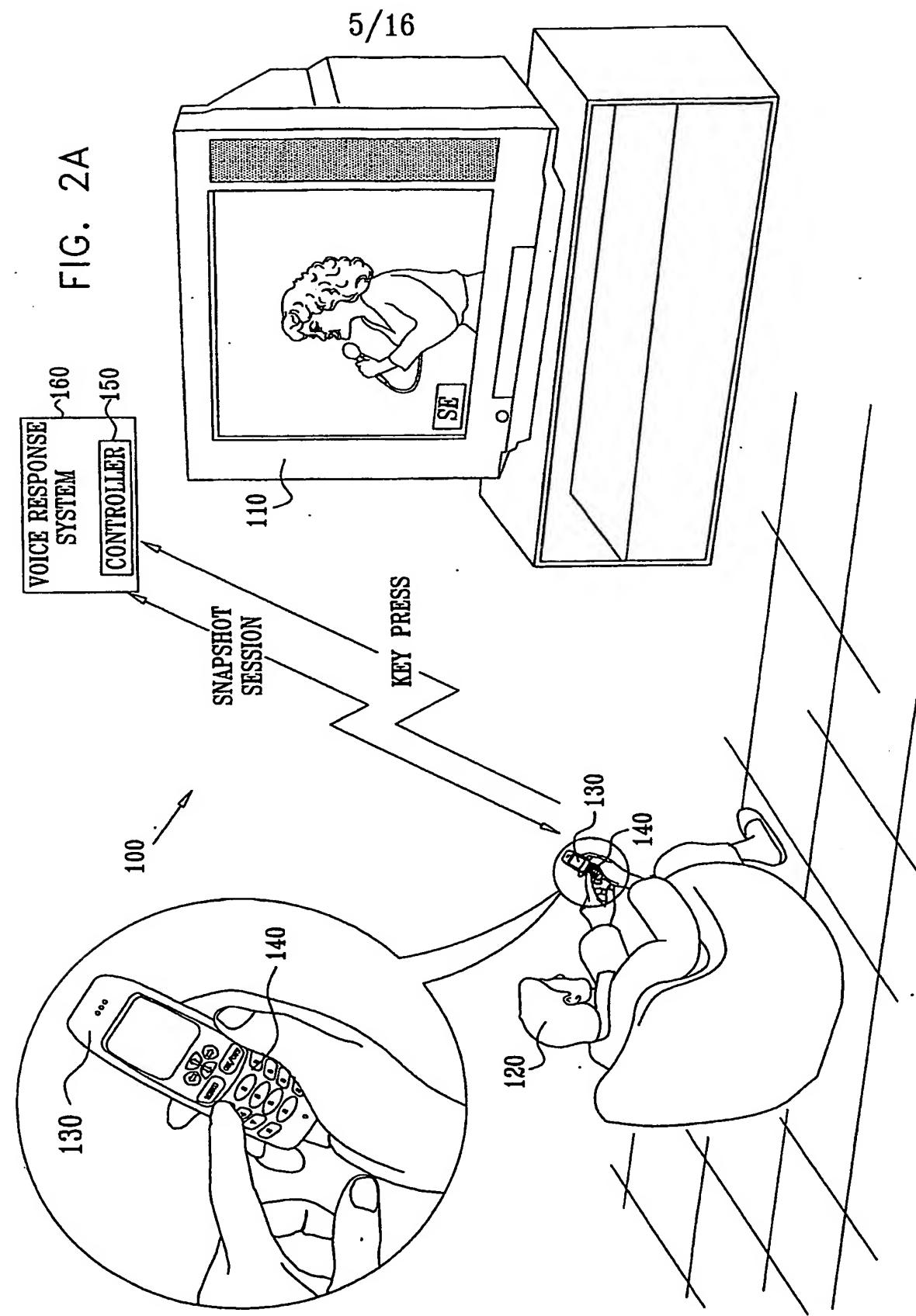
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FIG. 1D
TO
HEADEND
VID



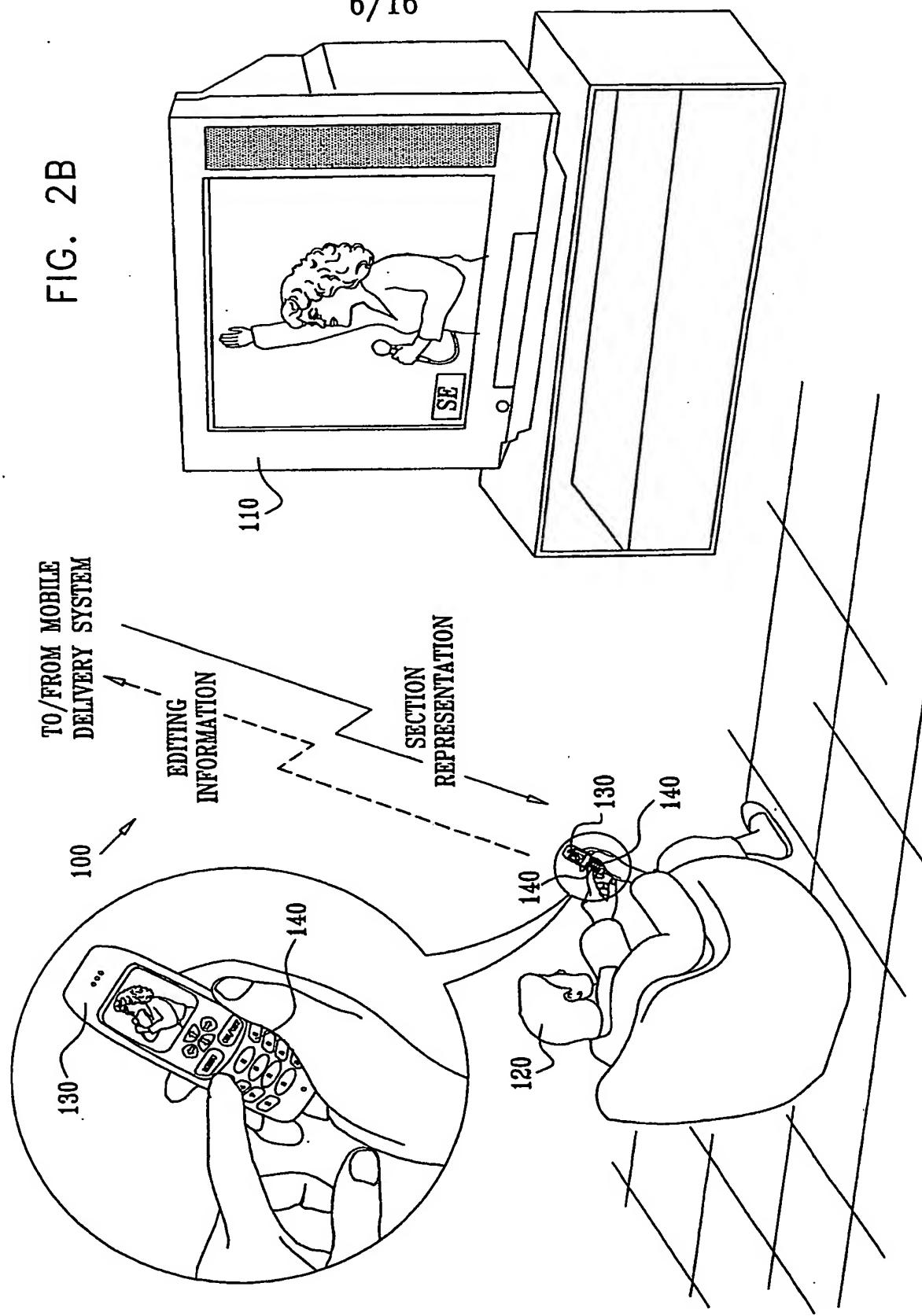
TO/FROM MOBILE
DELIVERY SYSTEM





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FIG. 2B



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FIG. 3A

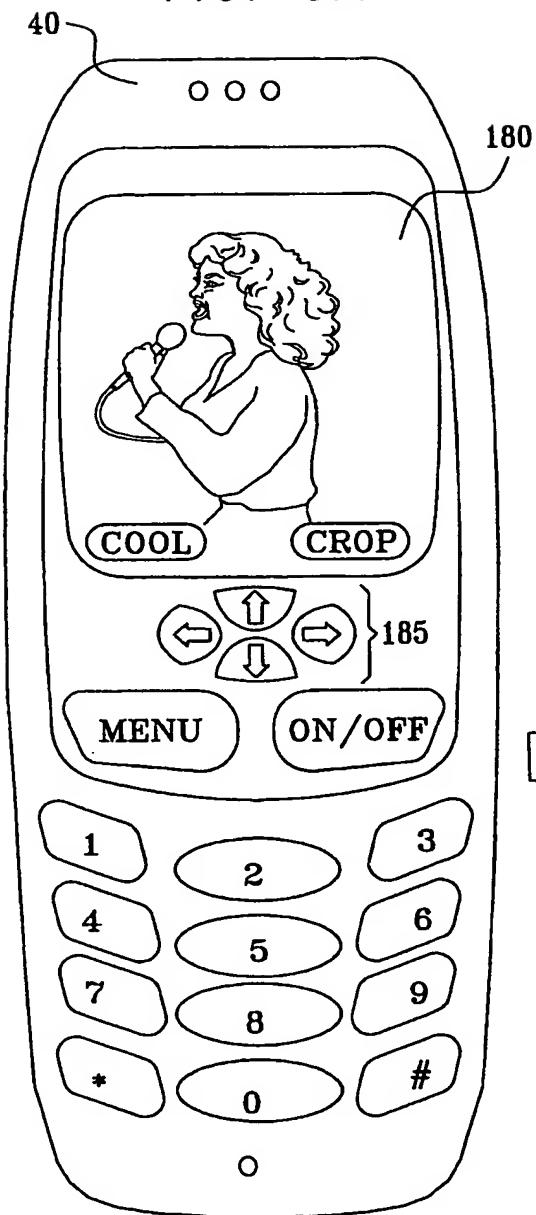
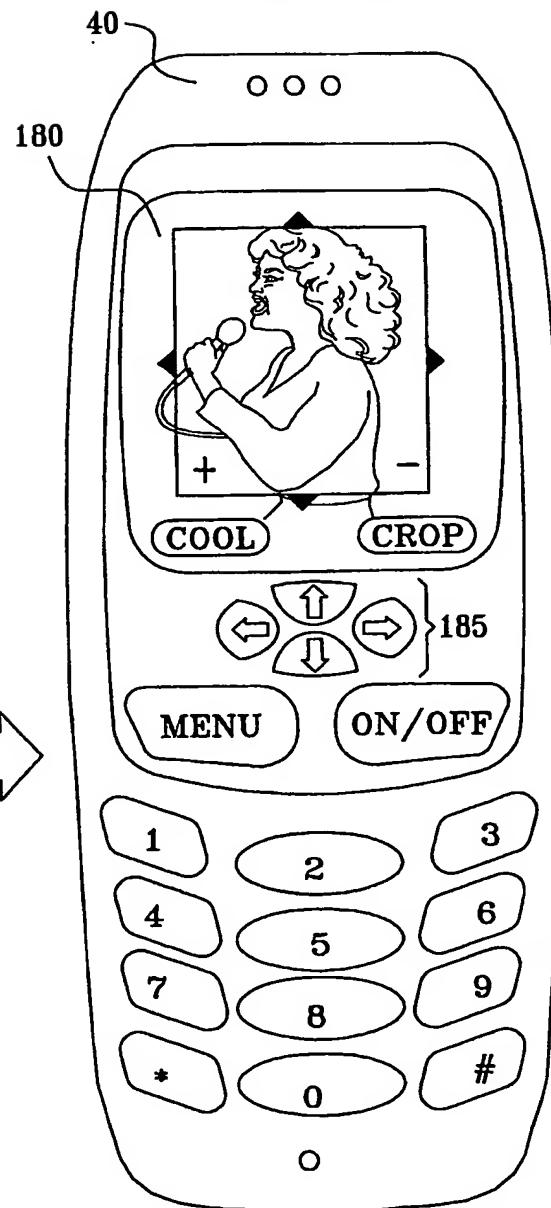


FIG. 3B



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FIG. 4A

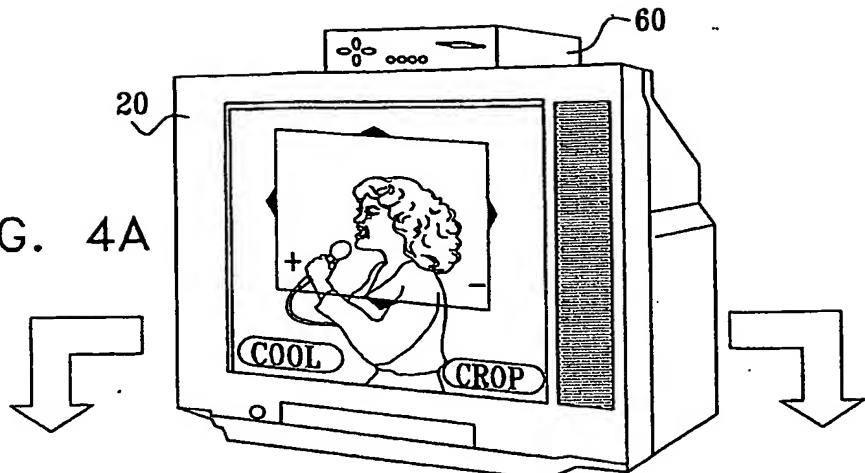


FIG. 4B

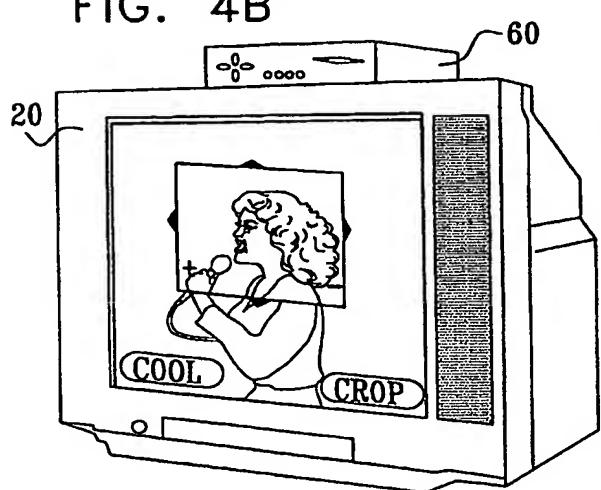


FIG. 4D

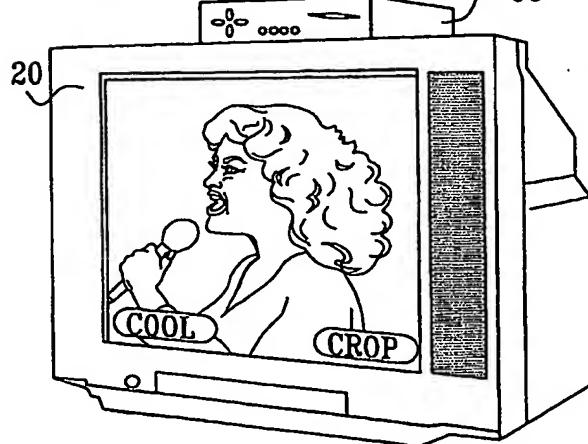
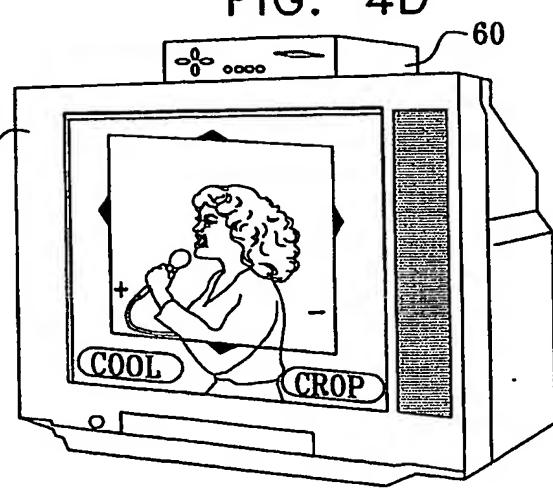


FIG. 4C

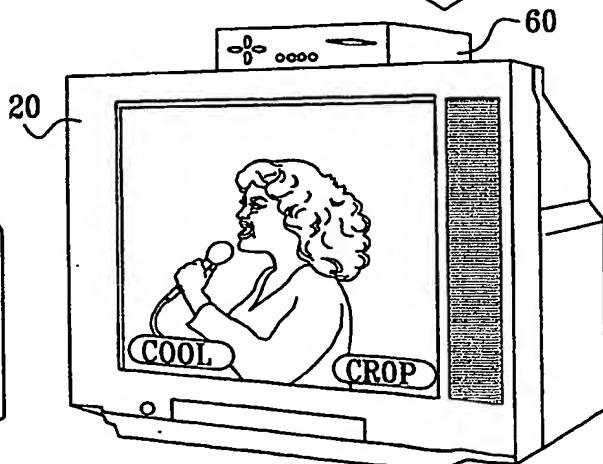
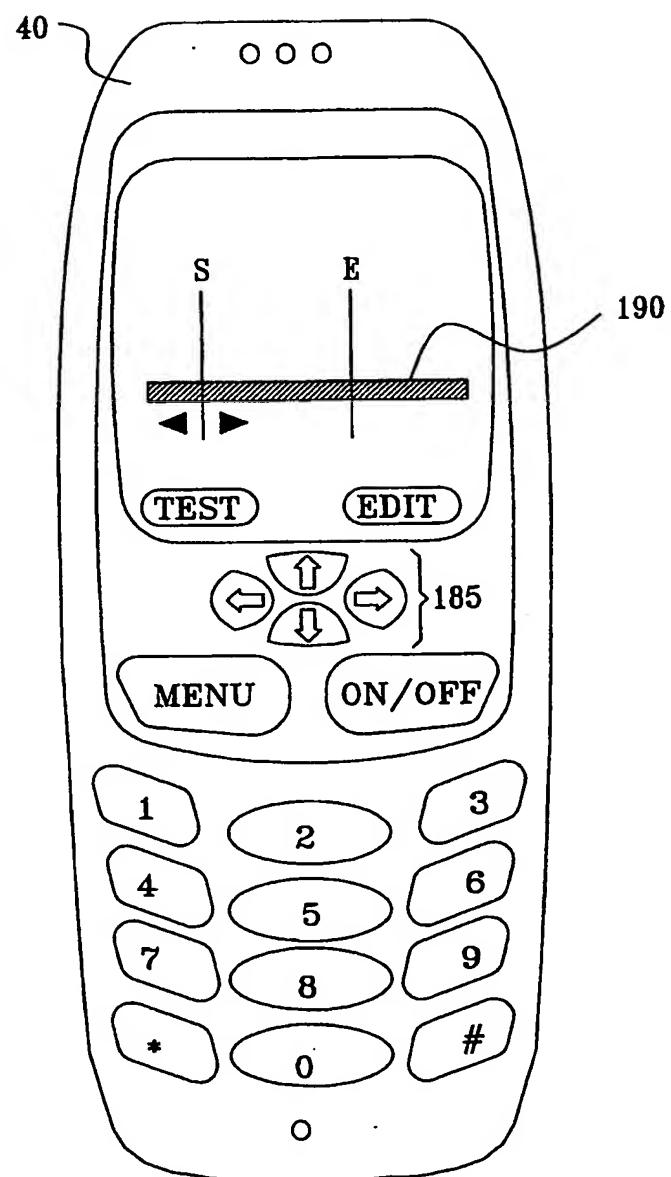


FIG. 4E

9/16

FIG. 5



10/16

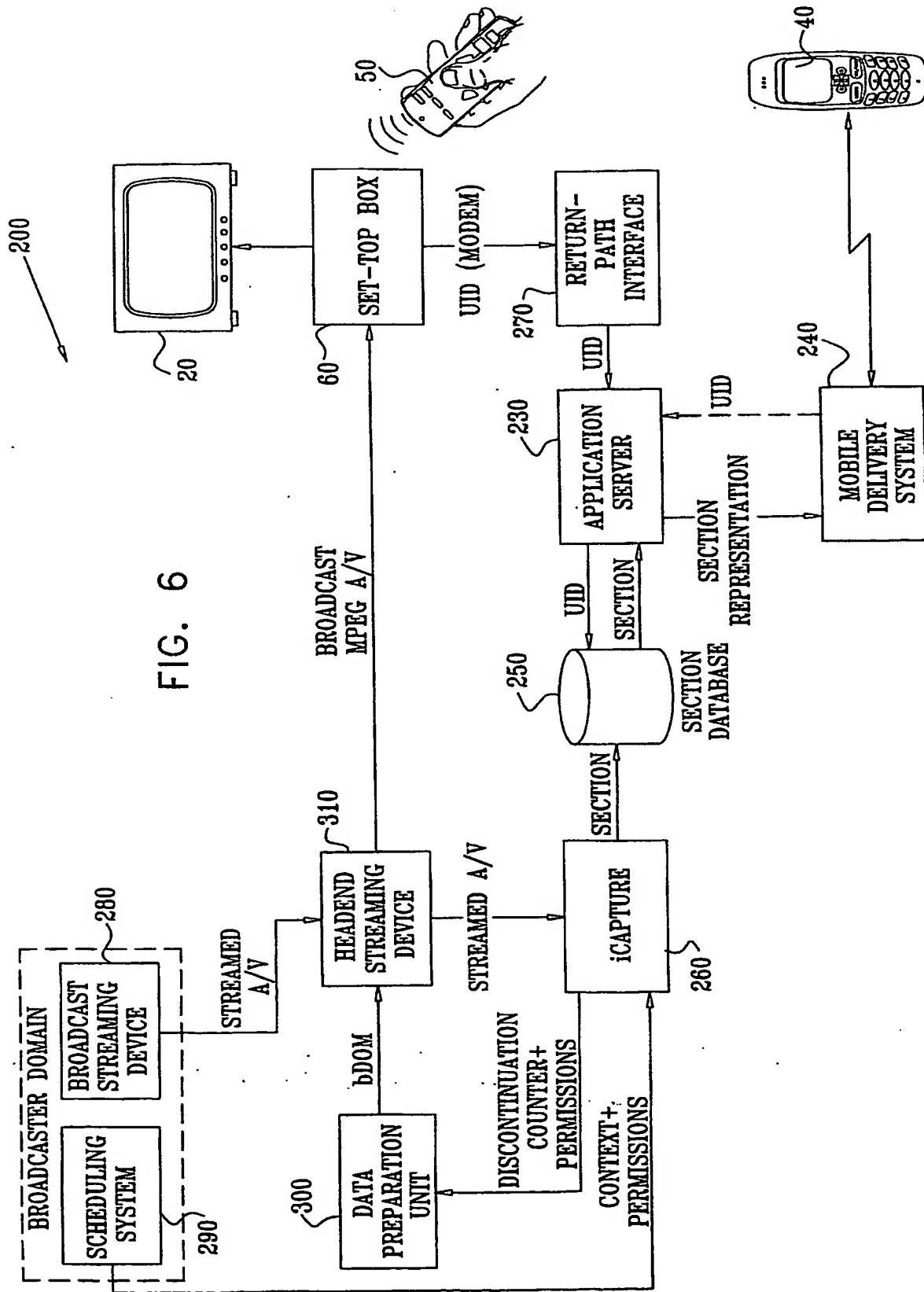
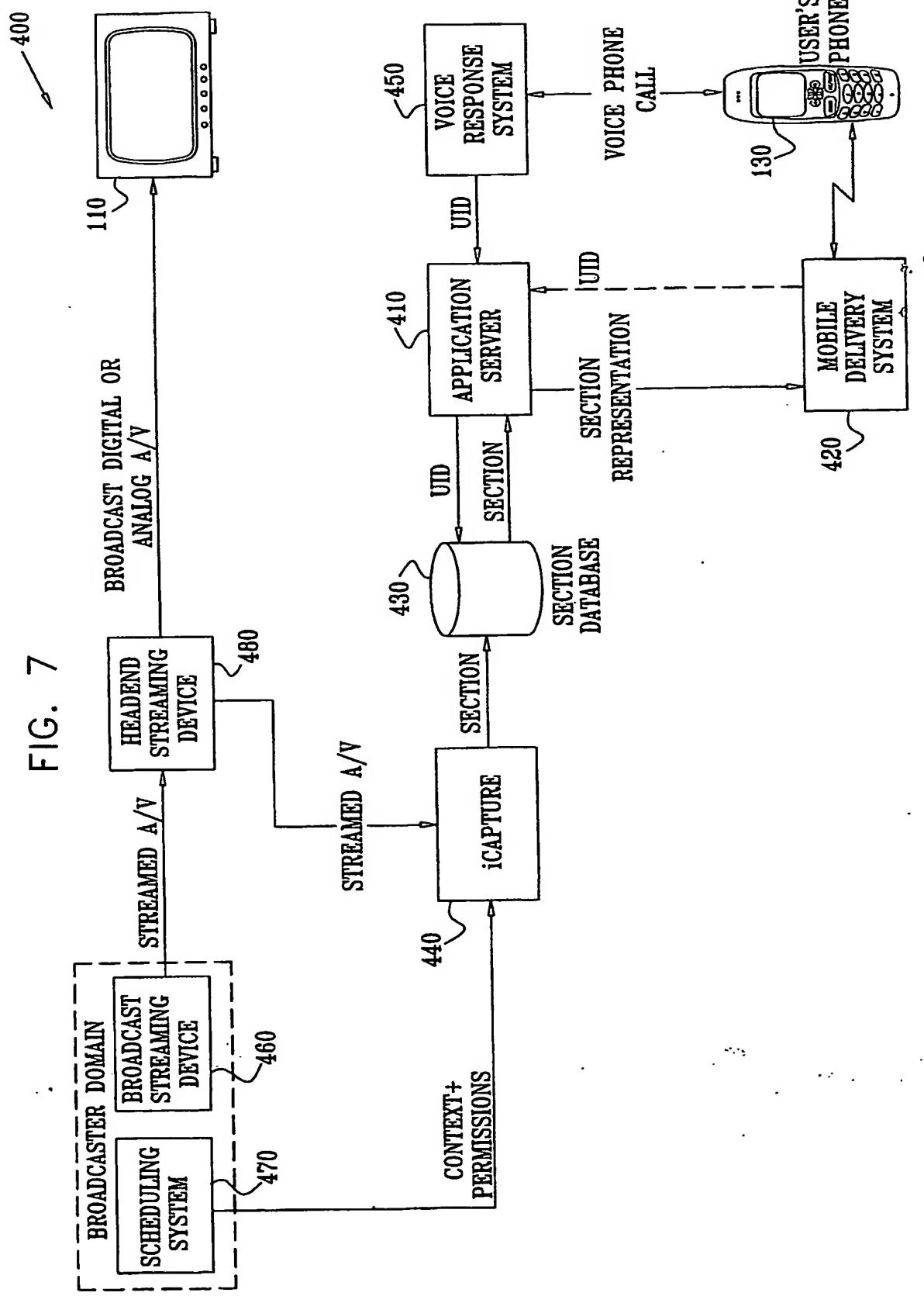
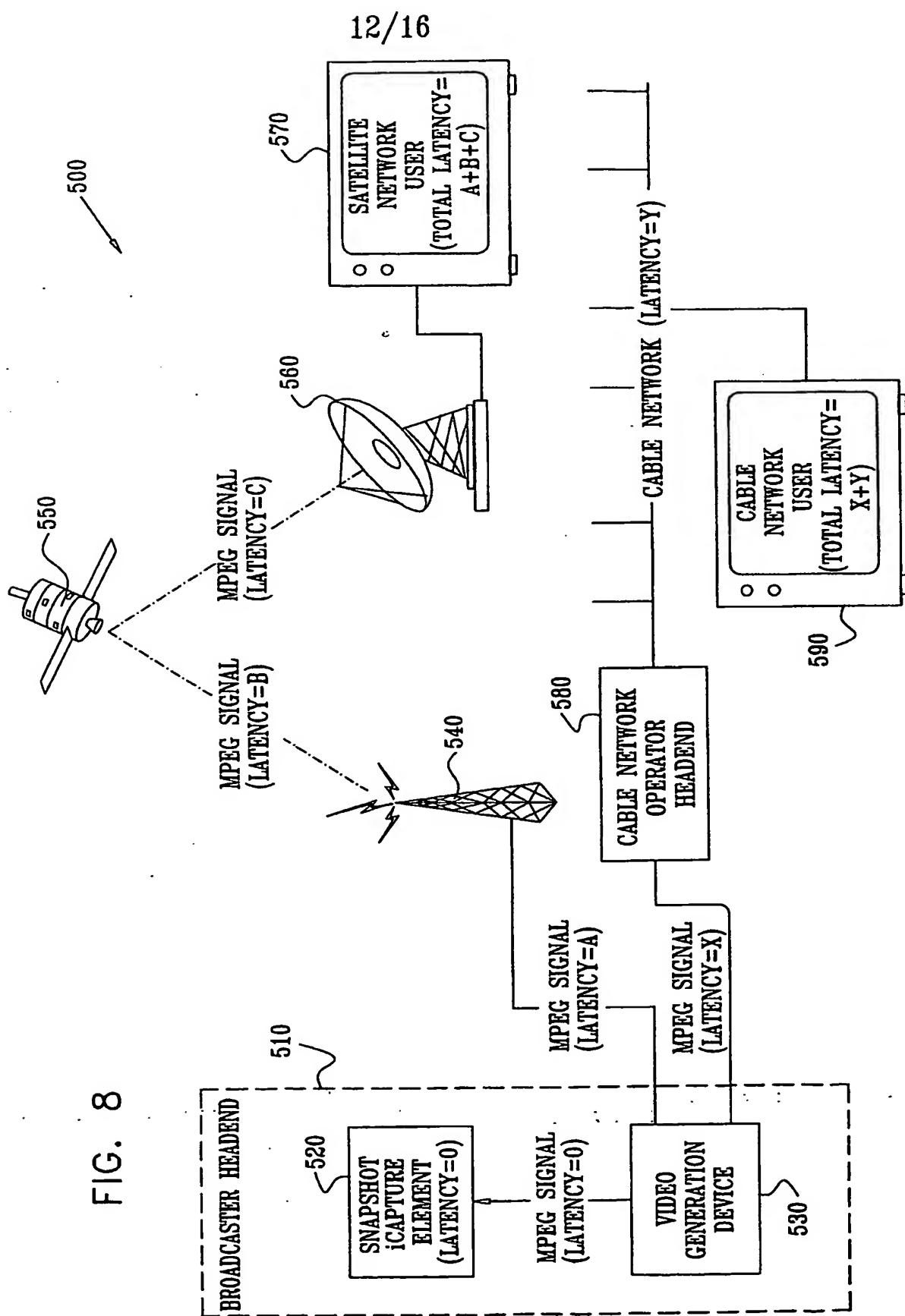


FIG. 6

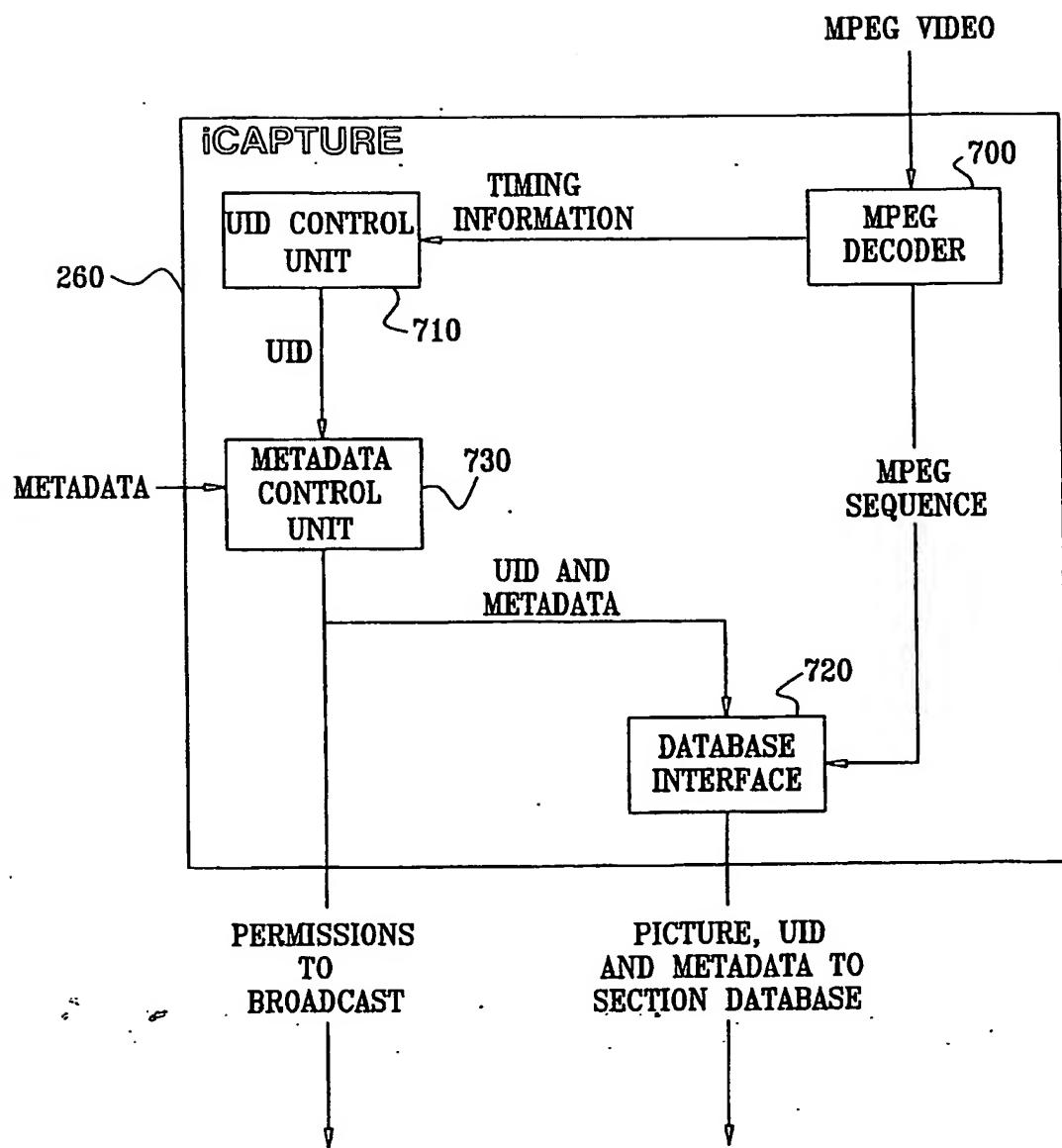
11/16





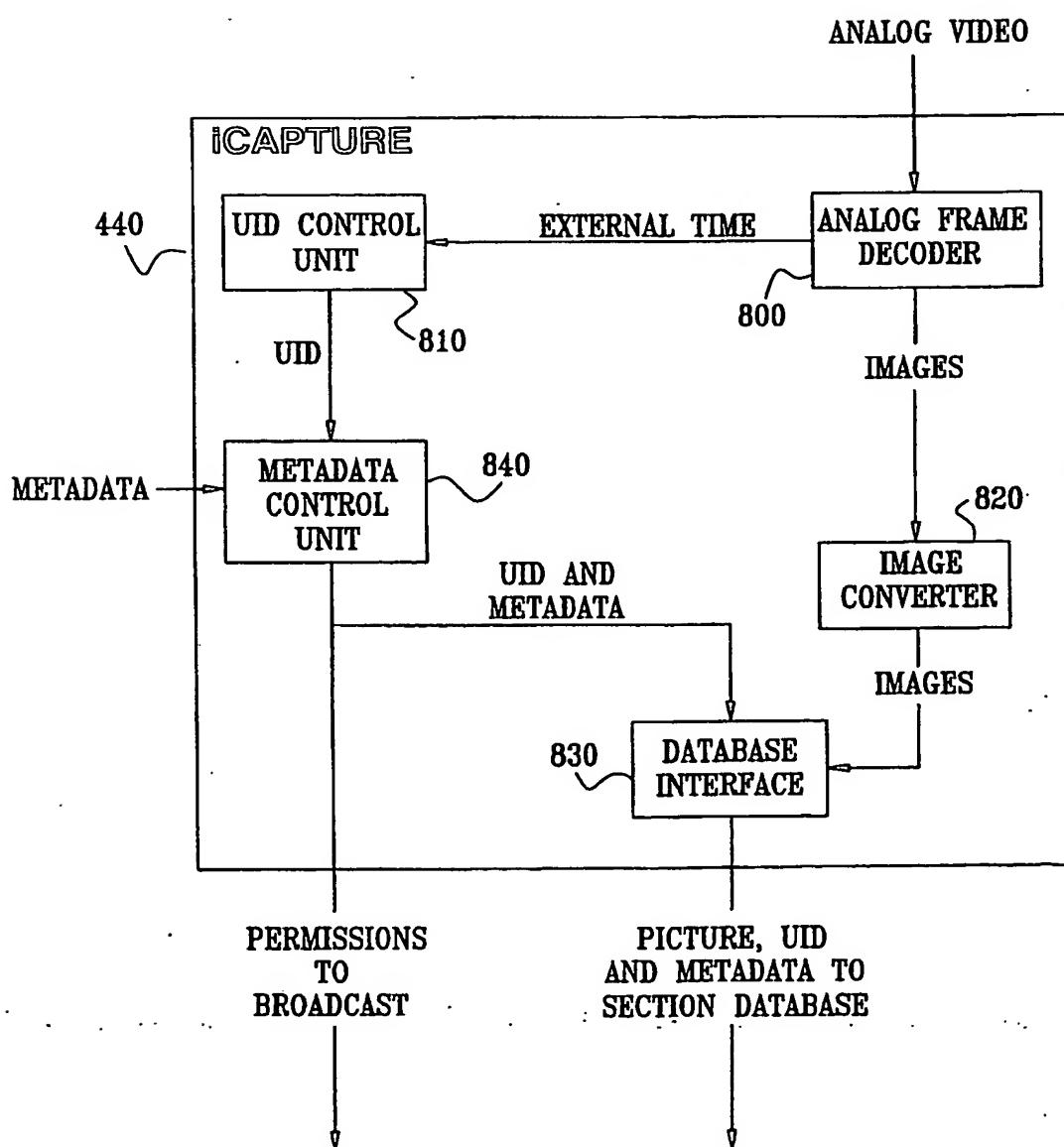
13/16

FIG. 9



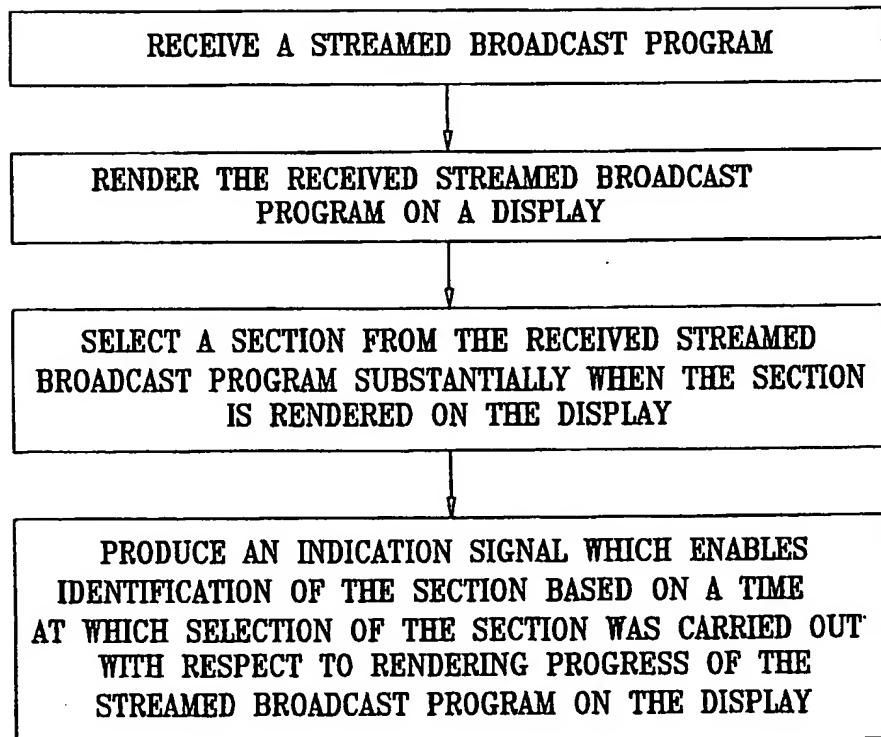
14/16

FIG. 10



15/16

FIG. 11



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FIG. 12

SELECT, IN A SNAPSHOT SELECTION MODE,
A SECTION FROM A STREAMED BROADCAST PROGRAM
SUBSTANTIALLY WHEN THE SECTION IS RENDERED
ON A DISPLAY

IDENTIFY THE SECTION BASED ON A TIME AT WHICH
THE SECTION WAS SNAPSHOT-SELECTED WITH RESPECT TO
RENDERING PROGRESS OF THE STREAMED BROADCAST
PROGRAM ON THE DISPLAY

TRANSMIT A REPRESENTATION OF THE SECTION TO
AN EXTERNAL DEVICE

FIG. 13

1000
DECODE A STREAMED PROGRAM INTO A
PLURALITY OF DISCRETE SECTIONS

1010
ASSOCIATE, IN SYNCHRONIZATION, A UID WITH EACH
DISCRETE SECTION IN THE PLURALITY OF DISCRETE
SECTIONS

1020
ENABLE STORAGE AND RETRIEVAL OF EACH OF THE
PLURALITY OF DISCRETE SECTIONS THROUGH
REFERENCE TO A UID



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/556,936	07/19/2006	Kristian Knak Nygaard	U 016025-8	5575
140	7590	04/14/2010	EXAMINER	
LADAS & PARRY LLP			STRONCZER, RYAN S	
26 WEST 61ST STREET			ART UNIT	PAPER NUMBER
NEW YORK, NY 10023			2425	
			NOTIFICATION DATE	DELIVERY MODE
			04/14/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

nyuspatactions@ladas.com

Office Action Summary	Application No.	Applicant(s)
	10/556,936	NYGAARD ET AL.
	Examiner Ryan Stronczer	Art Unit 2425

– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 05 January 2010.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 75-78,81-95,98-100,103-106,116-125,127-132,134-137,150 and 156 is/are pending in the application.
- 4a) Of the above claim(s) 81,87-94,101,102,117-125,131,132 and 134-137 is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 75-78,82-86,95,98-100,103-106,116,127-130,150 and 156 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) Notice of Informal Patent Application
- 6) Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 75-78, 82-86, 95, 98-100, 103-106, 116, 127-130, 150, and 156 are rejected under 35 U.S.C. 103(a) as being unpatentable over Logan et al. (Pub. No.: US 2005/0005308) and further in view of Wanderscheid et al. (US Pat. No.: 5,602,582) and Reisman (Pub. No.: US 2003/0229900).

As to amended claims 75, 150, and 156, Fig. 1-3 of Logan teach a method of transmitting a selection of a streamed broadcast program, such as a specific play of a football game. As to the method for "**transmitting a video and/or audio sequence to a target device based on a selection of a streamed broadcast program, the streamed broadcast program being broadcast to a user for being rendered on a display, the selection being selected from the streamed broadcast program by the user pressing a key on a keypad of a user selection unit, the selection being made by the user at a selection time substantially when the selection is rendered on the display,**" the method of Logan allows a user to select a selection of a video program (e.g., a specific play of a football game) to be transmitted from the headend to the user's client device. As to the amended limitation that said selection is made by a user pressing a key on a keypad and the selection being made by the user at a

selection time, Logan teaches that the user can make said selection using a remote control. That the selection is made at the time that the user makes the selection is inherent in Logan's system.

As to the limitations of “[1] computing the selection time when the user pressed the key on the keypad” and “[2] identifying the selection based on the computed selection time when the user pressed the key on the keypad with respect to rendering progress of the streamed broadcast program,” Logan teaches that the system can be implemented through a network personal video recorder (nPVR) system and selecting a previously broadcast segment (e.g., a specific play of a football game) inherently requires identifying the location of said play in the broadcast stream relative to the whole stream; however, Logan does not explicitly teach computing said selection time or identifying the selection based on said computed time, as recited. In an analogous art, col. 4 and Fig. 3-4 Wanderscheid teach a method for processing an input signal related to streamed digital video data wherein the system identifies a time I at which the user input is received, correlates said time I to a table of time indices, and performs an action based on said time index. Specifically, Wanderscheid teaches:

As an example, data stream 310 might represent a video clip promoting merchandise in a women's clothing store...A user input signal is identified during data stream 310 at time I . Upon receiving the input signal from remote controller 120, CPE 114 will determine a time index based on I . Referring now to FIG. 4, there is illustrated a look-up table used in association with the time indexed streamed digital video data. Continuing the previous example, the input signal is received by CPE 114 at time I between T_3 and T_4 . Accordingly, CPE 114 uses T_4 to index into the look-up table of FIG. 4. Preferably, the timer and the look-up table reside in the memory of CPE 114. After the look-up is performed, CPE 114 executes a branch instruction associated with the T_4 entry. In this example, a user generated input signal received by CPE at time I would result in CPE 114 transferring execution

control to routine 3. The branch instruction could incorporate any execution transfer programming technique. Examples include case and switch statements, if-then-else statements and GOTO statement. (col. 4/lines 26-59)

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Logan with the time index computation taught by Logan to enable the segment selection taught by Logan without having to navigate the menu of Logan. As to [2], one of ordinary skill in the art at the time of the invention would have recognized that the routine corresponding to each time index of Wanderscheid (Fig. 4) could be a control routine to cause the segments (e.g., plays) taught by Logan to be transmitted to the user. One of ordinary skill in the art at the time of the invention would have recognized this as a combination of known elements in the art that would have yielded predictable results.

As to the final limitation of “[3] transmitting the video and/or audio sequence based on the selection to at least one of an external device and an external medium,” in an analogous art, Fig. 8 of Reisman teaches a method wherein a user's set top box (STB) can communicate with a headend system to communicate video data to that same user's PC to perform "session coordination." It would have been obvious to one of ordinary skill in the art at the time of the invention that the session coordination of Reisman could be incorporated into the system of Logan so that a user of Logan's system could select a discrete segment of a broadcast program to be transmitted to the user's PC instead of to the user's television. This would have been desirable so as to allow a user to replay or share a segment of a program without interrupting viewing said program.

As to claim 76, the recited receiving an indication signal is inherent in the system of Logan wherein the user sends a signal to the nPVR server indicating a specific segment of programming to receive.

As to claim 77, the recited computing and recognizing is inherent in the system of Logan, as illustrated in Fig. 3.

As to claim 78, Fig. 1-3 of Logan teach the recited UID.

As to claim 82, Fig. 8 of Reisman teaches the recited computing device.

As to claims 83 and 84, Examiner notes that claim 75 does not positively recite the external medium recited in claim 75; however, Examiner takes Official Notice that it is well-known in the art for a PC to comprise a hard drive or other storage means which is equivalent to the recited "medium in the external device."

As to claim 85, Reisman teaches that said session coordination can be accomplished using a JAVA application (see, e.g., [0057], [0137]).

As to claim 86, Reisman teaches that the session coordination of Fig. 8 comprises displaying the selected content on the user's computing device.

As to claim 95, it would have been obvious to one of ordinary skill in the art at the time of the invention that a user could use the system of Logan to select additional programming segments preceding or following the currently selected segment, as recited.

As to claims 98 and 99, the recited streamed video or multimedia program is inherent in Logan.

As to claim 100, Fig. 3 of Logan teaches that each selection (e.g., a specific down of a football game) corresponds to a defined range of time, thus if the user does not know exactly when the selection occurred, he will still be able to locate the desired selection using the nPVR system of Logan in a manner cumulative with the recited error range.

As to claim 103, Logan teaches that the user selects the desired segment using a remote control [ABST].

As to claim 104, the recited video, multimedia, or A/V program is inherent in Logan.

As to claim 105, Examiner takes Official Notice it would have been obvious to one of ordinary skill in the art at the time of the invention that the user's STB would send the request for a segment containing the recited indication signal to the headend.

As to claim 106, the recited functionality is inherent in the nPVR sever of Logan.

As to claim 116, Logan also teaches that the system can be implemented in a video on-demand (VOD) system [0037] and Examiner takes Official Notice that it was well-known in the art at the time of the invention for a user of a VOD to send a signal from their STB to the headend agreeing to pay for the distribution of said VOD content.

As to claims 127 and 128, Examiner takes Official Notice that it was well-known in the art at the time of the invention for a content provider such as a broadcast network to insert branding information such as a network logo into broadcast content and that it would have been obvious to one of ordinary skill in the art at the time of the invention that said logo would still be present when a user accessed time-shifted content in an

nPVR system such as that taught by Logan, said logo being equivalent to the owner rights code recited in claim 128.

As to claim 129, the recited UID based on a time code is taught by Fig. 3 of Logan.

As to claim 130, as the time-shifted nPVR segments of Logan are derived from broadcast programming, it is inherent that the recited UID would also be derived from said broadcast programming.

Response to Arguments

Applicant's arguments filed 27 November 2009 have been fully considered but they are not persuasive.

With respect to claims 75, 150, and 156, Applicant alleges that it would not be obvious to modify Logan based on Wanderscheid for the following reasons:

1. The remote control click of Wanderscheid is only relevant while viewing the video. However, the purpose of Logan is to enable a user to select which segments to view based on the selection guide descriptions so as not to have to view the whole recording.

2. If the system of Wanderscheid was applied to Logan, the user may have to view segments that the user does not want to view in order to get to the segment that the user wants to view - then the selection of that segment by clicking the remote control becomes redundant, as the user has already viewed that segment. The selection guide of Logan already performs the task of enabling the user to select segments based on descriptive labels in a very efficient manner without having to view the whole recording. Therefore, modifying Logan based on Wanderscheid destroys the system of Logan and makes it unworkable for the user.

3. Wanderscheid would not allow selection of multiple segments at one time and in a different order as is possible with Logan's selection guide. Therefore, the Wanderscheid remote control click would be more limiting than the selection guide of Logan.

The Examiner respectfully disagrees. With respect to Applicant's assertion that the combination of Wanderscheid and Logan would not have been obvious because, "**[1] the remote control click of Wanderscheid is only relevant while viewing the video. However, the purpose of Logan is to enable a user to select which segments to view based on the selection guide descriptions so as not to have to view the whole recording,**" the Examiner notes that Wanderscheid identifies the time at which the user input was entered relevant to the viewing of the program or of the segment being displayed, and thus would have produced the desired effect when combined with Logan, regardless of when the playback took place.

With respect to Applicant's assertion that "**[2] [t]he selection guide of Logan already performs the task of enabling the user to select segments based on descriptive labels in a very efficient manner without having to view the whole recording. Therefore, modifying Logan based on Wanderscheid destroys the system of Logan and makes it unworkable for the user,**" the Examiner reiterates, as noted above, that Wanderscheid identifies the time at which the user input was entered relevant to the viewing of the program or of the segment being displayed and does not require the user to view the entire program, as alleged. Regarding the allegation that modifying Logan with Wanderscheid as suggested above "destroys the system of Logan," the Examiner respectfully disagrees. While the Examiner agrees that the selection guide of Logan performs the task of enabling the user to select segments based on descriptive labels in a very efficient manner, the Examiner maintains that modifying Logan with Wanderscheid would further enhance the efficiency of Logan's

system by providing the user with a quick, "one click" means of selecting a desired system without having to invoke or navigate Logan's menu.

The Examiner finds that Applicant's final allegation that "**[3] Wanderscheid would not allow selection of multiple segments at one time and in a different order as is possible with Logan's selection guide. Therefore, the Wanderscheid remote control click would be more limiting than the selection guide of Logan,**" is not germane to the claims at issue and the Examiner maintains that the combined teachings of Logan in view of Wanderscheid, when considered as a whole, teach the functionality recited therein.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ryan Stronczer whose telephone number is (571) 270-3756. The examiner can normally be reached on 7:30 AM - 5:00 PM (EDT), Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian T. Pendleton can be reached on (571) 272-7527. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ryan Stronczer/
Examiner, Art Unit 2425

/Brian T. Pendleton/
Supervisory Patent Examiner, Art Unit 2425



US 2005005308A1

(19) **United States**

(12) **Patent Application Publication**

Logan et al.

(10) **Pub. No.: US 2005/0005308 A1**

(43) **Pub. Date: Jan. 6, 2005**

(54) **METHODS AND APPARATUS FOR RECORDING AND REPLAYING SPORTS BROADCASTS**

(60) Provisional application No. 60/443,379, filed on Jan. 29, 2003.

(75) Inventors: **James D. Logan, Candia, NH (US); Scott A. Durgin, North Andover, MA (US); Dana Burd, Charlestown, MA (US)**

(51) **Int. Cl. 7** H04N 7/173; H04N 7/10; H04N 7/025

Correspondence Address:

**CHARLES G. CALL
68 HORSE POND ROAD
WEST YARMOUTH, MA 02673-2516 (US)**

(52) **U.S. Cl.** 725/135; 725/139; 725/32; 725/88; 725/102

(73) Assignee: **Gotuit Video, Inc.**

ABSTRACT

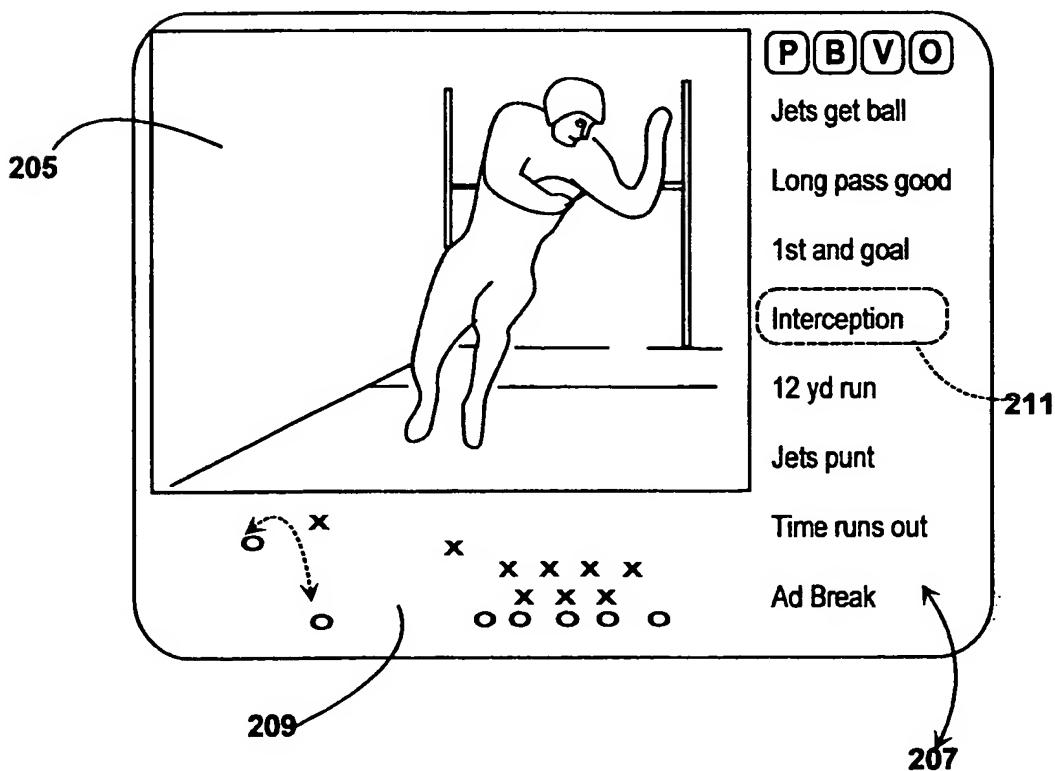
(21) Appl. No.: **10/767,930**

(22) Filed: **Jan. 29, 2004**

Related U.S. Application Data

(63) Continuation-in-part of application No. 10/060,001, filed on Jan. 29, 2002.
Continuation-in-part of application No. 10/165,587, filed on Jun. 8, 2002.

A system for replaying a broadcast sports event using a video on demand or personal video recording system. Metadata is created that subdivides the original broadcast into segments, and associates descriptive information with each segment. Playlists that specify an ordered subsequence of the sequence may be selected and used to present a variety of expanded or condensed versions of the sporting event to a viewer. Navigation controls including segment lists, specially formatted screen displays, and special functions under the control of a user-operated remote control, facilitate the interactive selection and control of the presentation.



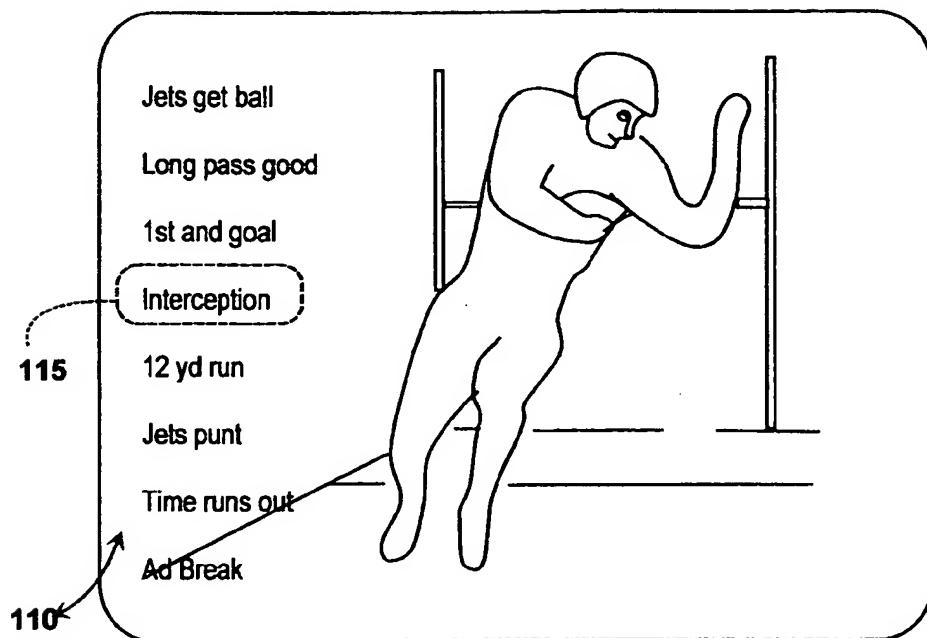


Fig. 1

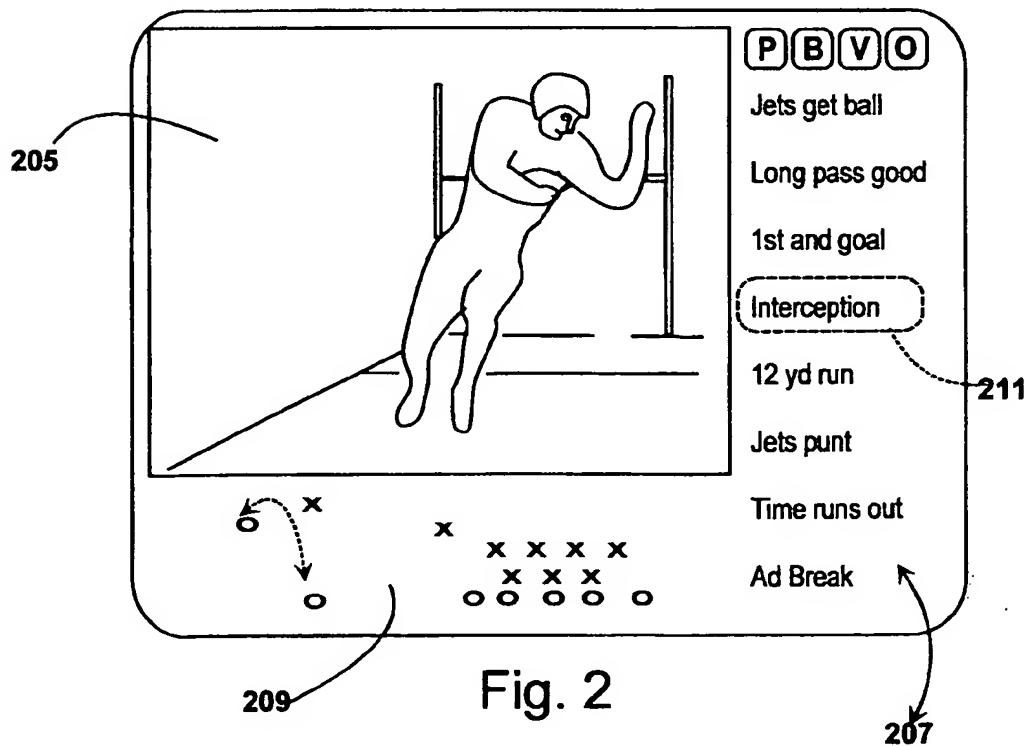


Fig. 2

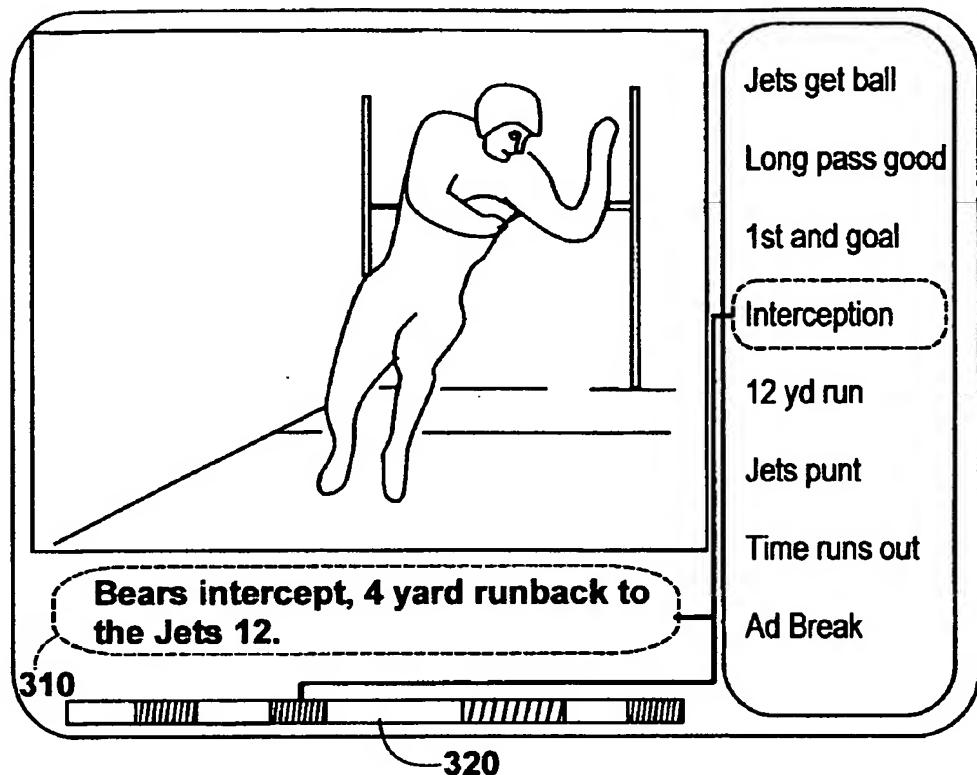


Fig. 3

METHODS AND APPARATUS FOR RECORDING AND REPLAYING SPORTS BROADCASTS

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application is a non-provisional of and claims the benefit of the filing date of U.S. Provisional Patent Application Ser. No. 60/443,379 filed Jan. 29, 2003

[0002] This application is also continuation in part of and claims the benefit of the effective filing date of U.S. application Ser. No. 10/060,001 filed by James D. Logan et al. on Jan. 29, 2002) entitled "Audio and Video Program Recording, Editing and Playback Systems Using Metadata" and published as U.S. patent application Publication No. 2002-0120925 on Aug. 29, 2002.

[0003] This application is also a continuation in part of and claims the benefit of the effective filing date of U.S. application Ser. No. 10/165,587 filed by James D. Logan et al. on Jun. 8, 2002 entitled "Audio and Video Program Recording, Editing and Playback Systems Using Metadata" and published as U.S. patent application Publication No. 2003/0093790 A1 on May 15, 2003.

[0004] The disclosure of each of the foregoing applications is incorporated herein by reference.

FIELD OF THE INVENTION

[0005] This invention relates generally, although in its broader aspects not exclusively, to methods and apparatus for presenting sports events to television viewers.

BACKGROUND OF THE INVENTION

[0006] The present invention belongs to a family of related systems that use metadata to control the playback of broadcast programming as disclosed in the previously issued patents and published patent applications summarized below. The disclosures of each of the following patents and published applications are hereby incorporated herein by reference.

[0007] U.S. Reissue Pat. No. Re 36,801 issued to James D. Logan et al. on Aug. 1, 2000 entitled "Time delayed digital video system using concurrent recording and playback" describes a mechanism for continually storing live television or radio broadcast programs in an addressable digital memory and playing back the broadcast program after a variable delay period under the control of the viewer, permitting the viewer to pause, replay, and fast-forward (skip) live programming.

[0008] U.S. Pat. Nos. 5,892,536 and 5,986,692 issued to James D. Logan et al. describe systems which employ metadata to selectively store, manipulate and playback broadcast programming. Some of the arrangements and features disclosed in those two patents may be summarized as follows:

[0009] 1. A remote editing station, which may be at the broadcast facility or at a remote location, classifies, describes or otherwise identifies individual segments of broadcast programming and sends metadata (sometimes referred to as "markup data") identifying and describing those segments to a remote client receiver. For example, the markup data may

identify individual segments by specifying the source and the time of the original broadcast, or by specifying some other unique characteristic of the broadcast signal. The program segments may be TV, radio, or Internet programs, or portions of programs, including individual songs, advertisements, or scenes.

[0010] 2. The communication link used to transmit the metadata to the client may take one of several forms, including the Internet, a dialup telephone link, the communications pathway used to carry the broadcast signals to the client, or other forms of communication used to transport the metadata to the client.

[0011] 3. At the client receiver, the metadata is used to identify particular program segments that may then be manipulated in one or more of a variety of ways. For example, the metadata may be used to selectively play back or record particular segments desired by the user; to re-sequence the identified segments into a different time order; to "edit-out" undesired portions of identified segments; to splice new information, such as computer text or advertising, into identified segments for rendering with the program materials, or to substitute different material (e.g. dubbing in acceptable audio to replace profanity) to make programming more acceptable to minors.

[0012] 4. The client receives and locally stores incoming broadcast programming and uses the markup data to identify desired segments within the stored program materials. The local storage mechanism may advantageously include means for concurrently recording live broadcasting while replaying a delayed version of the previously recorded programming as described in U.S. Reissue Pat. No. 36,801 issued to James D. Logan et al.

[0013] 5. The markup data can provide a detailed "electronic program guide" to the broadcast programming previously received and stored in a personal video recorder (PVR) or an audio storage device, permitting the user to selectively play back a desired segment or portion of the programming previously recorded.

[0014] 6. The markup data may be used to create a recorded collection of desired segments extracted from the buffered broadcast, allowing the desired segments to be saved while the remainder of the buffered materials is discarded to conserve recording space.

[0015] 7. Special markup signals may be selectively sent to individual subscribers based on his or her indicated preferences so that only preferred program segments are identified and processed. For example, a subscriber might request markup data only for sports and news.

[0016] U.S. Pat. Nos. 5,271,811, 5,732,216, and 6,199,076, and co-pending application Ser. No. 09/782,546 filed on Feb. 13, 2001, by James D. Logan et al. describe a program distribution system which incorporates the following features:

[0017] 1. A host system organizes and transmits program segments to client subscriber locations.

[0018] 2. A scheduling file of metadata (a "playlist") schedules the content and sequence of a playback session, which may then be modified by the user.

[0019] 3. The content of the scheduled programming is varied in accordance with preferences associated with each subscriber.

[0020] 4. Program segments are associated with descriptive subject matter segments, and the subject matter segments may be used to generate both text and audio cataloging presentations to enable the user to more easily identify and select desirable programming.

[0021] 5. A playback unit at the subscriber location reproduces the program segments received from the host and includes mechanisms for interactively navigating among the program segments, including jumping from segment to segment in both forward and reverse directions.

[0022] 6. A usage log is compiled to record the subscriber's use of the available program materials, to return data to the host for billing, to adaptively modify the subscriber's preferences based on actual usage, and to send subscriber-generated comments and requests to the host for processing.

[0023] 7. Voice input and control mechanisms included in the player allow the user to perform hands-free navigation of the program materials and to dictate comments and messages, which are returned to the host for retransmission to other subscribers.

[0024] 8. The program segments sent to each subscriber may include advertising materials, which the user can selectively play to obtain credits against the subscriber fee.

[0025] U.S. patent application Publication No. 2002/0120925 A1 published on Aug. 29, 2002 (based U.S. application Ser. No. 10/060,001 filed by James D. Logan et al. on Jan. 29, 2002) entitled "Audio and Video Program Recording, Editing and Playback Systems Using Metadata" describes structures and functions used to provide metadata control over the recoding, editing and playback of audio and video programming, including the use of mechanisms at the user's location for creating metadata which may be used in combination with metadata provided by an external source, for editing metadata in various ways at the user's location, for automatically responding to user activity to generate new metadata which characterizes the user's preferences and which serves to automatically identify and describe (or rate) programming segments, and for responding in numerous ways to the available metadata to enhance the utility and enjoyment of available broadcast materials.

[0026] U.S. patent application Publication No. 2003/0093790 A1 published on May 15, 2003 (based U.S. application Ser. No. 10/165,587 filed by James D. Logan et al. on Jun. 8, 2002) entitled "Audio and Video Program Recording, Editing and Playback Systems Using Metadata" describes systems for utilizing metadata created either at a central location for shared use by connected users, or at each

individual user's location, to enhance user's enjoyment of available broadcast programming content. A variety of mechanisms are employed for automatically and manually identifying and designating programming segments, associating descriptive metadata which the identified segments, distributing the metadata for use at client locations, and using the supplied metadata to selectively record and playback desired programming.

SUMMARY OF THE INVENTION

[0027] The present invention takes the form of methods and apparatus for recording and replaying a televised sports event in a more format selected by the viewer. Although many of the techniques to be described are used to replay a football game, it should be understood that most of these techniques can in most cases be applied to other sports events as well, including baseball, basketball, hockey, boxing, etc.

[0028] In this system, the entire broadcast of a football game is recorded in a storage device which can be accessed by and controlled by the viewer, such as a program storage device in a cable or satellite VOD (video on demand), PVR (personal video recorder), nPVR (network personal video recorder) systems as described under "Platforms," below. In addition, related program content which supplements the broadcast version of the football game may be made available, such as program content obtained from sources such as league cameras shooting footage for the coaches, interviews and background material on particular players or subjects, tutorial materials for explaining topics which may be unfamiliar to a particular viewer, advertising and promotional materials, and the like.

[0029] In the description that follows, user functions are typically selected using a hand held remote control unit (which will be referred to simply as a "remote"), often from menu selections or other visual indicators presented on a conventional television monitor; however, voice commands, touch screens, or other input means, may also be used. Personal computer (PC) systems which are connected to the television set or set top box, and connected to a server by some mechanism such as a Web interface, may be used to retrieve metadata and media content, set up user preferences, make catalog selections, and/or set up system parameters. When a remote or other device employing "buttons" is used, the manner in which buttons are associated with functions can play an important role in making the user interface intuitively easy to use, as illustrated in the examples which follow.

[0030] Metadata created either automatically or by human editors after the live sports event but before the playback is employed to identify the starting and ending points of segments of the stored broadcast and supplemental programming. Additional metadata in the form of "playlists" may be used to selectively play back selected sequences of these segments for the viewer, potentially in a different order than the sequence in which the segments were originally broadcast and recorded. In addition, the user is presented with a segment selection guide which is displayed to the viewer and which enables the user to selectively control which segments, or which sequence of segments (playlists), are reproduced. The metadata will typically be created as early as possible, but it is also likely that more metadata will

available for any given segment as time passes; therefore the longer a viewer waits to watch the game, the more developed the playlists may become.

BRIEF DESCRIPTION OF THE DRAWINGS

[0031] In the detailed description which follows, frequent reference will be made to the attached drawings, in which:

[0032] FIG. 1 shows a full screen presentation on a video presentation device of a sports event with a segment guide overlaying the media content image;

[0033] FIG. 2 shows a display screen separated into panels including a video viewing area, a segment guide area, a toolbar, and an information area; and

[0034] FIG. 3 shows a display screen which uses the information area to provide more detailed information about a highlighted segment on the segment guide.

DETAILED DESCRIPTION

[0035] Platforms

[0036] The system for recording and playing back sports programming may be used on a variety of different platforms:

[0037] 1. A Video on Demand (VOD) system with storage at the headend and where viewing would be totally time-shifted; that is, the sports programming would be stored in its entirety in a VOD video server before being made available to subscribers.

[0038] 2. A networked Personal Video Recording (nPVR) system where the storage is again at the headend and viewing might be only partially time-shifted (that is, the game may still be in progress as the viewer begins to view the game, normally from the start, on a delayed basis).

[0039] 3. A Personal Video Recorder (PVR), where the storage is local and the game may be partially or totally time-shifted.

[0040] 4. An Satellite Video on Demand system where content is specifically broadcast in order to be placed in storage at the subscriber's location, typically in a PVR that may be incorporated into a satellite receiver. The satellite provider may choose which programs are downloaded, often during nighttime hours so that they will be available to viewers on demand the following day (and thereafter until deleted).

[0041] Each of the foregoing platforms is described in more detail in U.S. patent application Publication 2003/0093790 A1 published on May 15, 2003. As described there, and in the other patents and applications identified in the "Background" section above, metadata may be created by human editors or by automated techniques which subdivides a program, such as a broadcast sports event, into segments. The metadata identify the location and extent of each segment, and may include text labels or other descriptive information characterizing individual segments. Segments may be described with short text labels (called "slugs," "tags," or "labels") which may be displayed as a segment "index" or "guide" on the television monitor. Using the remote control to generate content navigation and selection

commands, user may first select a playlist that presents all or selected parts of a sports program, may jump from segment to segment in either direction, or jump to any desired segment listed in the displayed segment guide, and thereby interactively control the presentation of the event.

[0042] As shown in FIG. 1, the segment index or guide, as seen at 110, may consist of a "transparent overlay" of which shows all or part of the segment labels that make up the playlist as list of text labels that overlays a full screen presentation of the content. The particular label of "slug" that describes the currently playing segment is preferably highlighted in some fashion as illustrated at 115 so that the user can visually associate the segment currently being played with the items on the list. By using the remote, the viewer can move an on-screen "cursor," or move the highlighted selection 115 to a different segment label and then, using the select button or the like, switch the playback to the selected segment. If the segment list is longer than the space allotted on the screen, it can scroll so that the highlighted segment label remains visible on the screen. Note that the segment label selected by the cursor may be indicated by one form of highlighting (e.g. a special text or text background color) while the segment label for the segment being viewed may be identified by a second mode of highlighting, such as a graphical pointer or icon positioned at the playing segment label. The highlighting mechanism may change to provide additional information as a navigation aid. For example, when segments showing plays when particular team is on offense may be identified with a highlighting icon that is that team's logo. Instead of an icon, the currently playing segment might be displayed in another color, or be indented or other placed in a different area of the screen, be displayed in a differently colored box, etc. Also, there might be a separate place on the screen that explicitly tells the user the segment slug of the currently playing segment. The currently playing segment indicator (whether it be icon, graphic, color, etc.) should automatically update as viewing goes to the next segment in the playlist.

[0043] As shown in FIG. 2, the screen display may also be divided into panels containing information and menus. The video image or "picture" of the segment being played is reduced to the size shown at 205, making room for a vertical panel at 207 to the right of the picture, as well as room for an information panel seen at 209 below the picture. The separate panels insure that the metadata-based information displayed on the screen will be readily visible, which may not always be the case with overlaid characters, and that the added information will not obscure the picture.

[0044] It should be noted that the viewer may elect to return the display to an unobstructed full screen view at any time, and likewise may redisplay the paneled version at any time that the user wishes to view the extra information provided by the metadata, or to navigate to a new segment, or perform some other function. In the fullscreen mode, the short "slug" or a longer description of the segment may be shown (or not, as selected by the viewer) in much the same way that close-caption text appears on screen when requested.

[0045] As seen at 220 in FIG. 2, a four-button toolbar is displayed in the upper right-hand corner of the screen. The four buttons are labeled "P" for Playlist, B for Bookmark, V for Vault and O for Options. By "clicking on" the P button,

the user can display a list of playlists which are available for that program, and if desired, switch to a different playlist. By clicking on the B button, the user can “bookmark” and later more easily return to the position currently being shown. By clicking on the V button, the user may place the segment currently being played in the user’s private “vault” which stores content the user may wish to view later. Finally, by pressing O, the user can call up an Options Menu which allows the user to select options and store preference data which will guide the system’s actions thereafter.

[0046] The information panel seen at 209 may be used to present a variety of different kinds of information about the game, including a “chalk talk” description of the play as illustrated at 209. As illustrated at 310 in FIG. 3, the information panel may also be used to provide a more detailed text description of the segment, an a graphical display which indicates the relative position and length of each segment compared to other parts of the playlist. Finally, the information panel may be used to show “scoreboard” information at the time of the segment, such as the down, yards required for a 1st down or to reach the goal, ball placement, number of timeouts remaining, whether or not there was a flag on the play, etc. This scoreboard information may provide a useful way to scan a playlist to identify and play action of particular interest to the viewer.

[0047] The information panel seen at 209 may also be used to present advertising, which may occupy all or part of the information panel, depending on the need to present other information.

[0048] In accordance with the invention, playlists supplied to the user by the content provider (such as a cable VOD or satellite provider) can be used to control the presentation of a special version of a sports event. Playlists that can be used to advantage in presenting sports events include the following:

[0049] Snap-to-Tackle: This playlist identifies and replays only those segments of a football game which depict play when the ball is in motion. Typically, presenting a football game to a viewer under the control of a “snap-to-tackle” playlist condenses the game down to about twenty minutes. The precise beginning (snap) and ending (tackle) of each play is selected by a human editor using the following guidelines: if players are “in motion” before the play, that footage is left in; if something extraordinary happens after the play, that is left in as well (these tail-endings might include treating an injured player or the handling of a penalty—sometimes skipping to a scene where the referee announces the penalty). Another example of material left in by a snap-to-tackle playlist might be a short celebration after a sack or in the end zone after a score. In both cases (before and after the play), time might be added to allow for the announcer to complete a sentence. Although the editor has discretion to leave in certain material in addition to events which occur during a play, the editor would not delete any of the between the hike and the tackle.

[0050] Clock-in-Motion: This playlist presents a condensed version of the game which lasts about an hour and deletes the broadcast time taken for pre-game, halftime, and post-game shows. It also drops timeouts, penalty discussions, and other segments recorded when the game is not in progress and the game’s official timekeeper’s clock is not moving. Exceptions would be scenes where the referee is

announcing a penalty or other important information is being conveyed to the audience.

[0051] Highlights: This playlist presents a highly condensed version of the game, showing only the “best” or “most interesting” selected by the human editor to reduce the game to perhaps five minutes in duration.

[0052] Most Important Plays: This playlist presents a highly condensed but still “structurally complete” game, showing only the most important plays of each drive (each set of downs). This playlist varies from the Highlights playlist above which shows the best plays regardless of when they occur. For instance all the Highlights action could occur in the fourth quarter. In the Most Important Plays playlist, however, the structure of the game is preserved as some representative plays are shown from each drive. A variant of this playlist would vary the amount of time per play depending on the outcome. For instance, if a pass were dropped, that would have very tight editing. If the pass play was for a first down, more time before and after the play would be left in.

[0053] Player Spotlight: In this playlist, the system pulls out and replays segments that are associated with specific players. A segment, or play, can be associated with more than one player and thus be used in multiple, different playlists devoted to different players. To access a particular player, the viewer displays a menu of players corresponding to the active roster. Individual players may be represented by name, picture, position, or any combination of these. The user may then select a playlist that plays only those plays, interviews, etc. that have been identified in the metadata as relating to the selected player of interest.

[0054] Other Highlights: Player Spotlights would be one example of “highlights” available using the system. A more generalized model of recombining stored segments would allow viewers to assemble playlists of highlights by player, team, play-type (e.g., hit, pass, or punt), or game situation (e.g. third downs). Furthermore, the highlights could be assembled across a single game, a library of recorded games representing a team’s season-to-date, or recordings stored for games recorded across the whole league in the case of play-type, game situation, or other non-player or team construct.

[0055] Best Hits: In this playlist, the “best hits” of the game being viewed are replayed. Similarly, other playlists may be used to identify highlights of other types of plays, such as passes/receptions, interceptions, turnovers, kickoffs, etc.

[0056] Downs and Yards: The “slugs” or labels presented by this playlist shows the down and yards-to-go (e.g., “3rd and 7 yds”). This is particularly important for viewers whom have not seen the game or do not know the outcome. These viewers may not want the suspense of the game spoiled, and if they are shown a tag that says “quarterback sacked” or “touchdown pass” before they see the play, then the suspense is largely lost. So, tag descriptions that simply tell the field position at the start of the play are less likely to reduce the suspense of the game, particularly when the content is viewed in Fullscreen mode and the user cannot see the other/neighboring tags. Note that this type of playlist concept applies to other sports as well (e.g., a segment description in a baseball playlist might merely identify the inning,

a stock car race playlist might indicate lap count, a golf playlist might identify the player and the hole being played. In short, this kind of playlist contains information that is known before the action shown in the segment actually happens, and hides the result of the play itself.

[0057] Other Playlists could include:

[0058] The complete game in Play-by-Play mode organized by quarter then play;

[0059] The complete game broken down drive-by-drive, with each drive further being broken down by play;

[0060] The complete game organized around the "story of the game" with distinct chapters not necessarily related to time, for instance: "Scoreless first quarter," "Patriots injury," "Patriots roar back," and "Opposition collapses" could all be chapter titles;

[0061] The complete game, but without commercial breaks. This playlist allows a provider to show sports content from the "back-haul feeds" in which commercial breaks in the live broadcast are dead-air (devoid of content) and not intended for viewers in that form. The complete game playlist, when presented, presents the game continuously, eliminating the commercial breaks.

[0062] The complete game, but containing only that content which is rights-approved for post-broadcast and/or on-demand viewing. This is particularly important for cases in which certain parts of the game (e.g., music playing in the stadium or on-air, in-depth coverage or background stories assembled by the broadcaster, etc.) haven't been cleared, so these pieces of content must be excised. This version of a complete game playlist provides an efficient means of presenting the content without producing a fully edited version that removes the uncleared content.

[0063] Scoring drives or scoring Plays only;

[0064] Plays in the Red Zone (ball inside the 20 yard line) only;

[0065] Third Down Attempts only;

[0066] Fourth Down Attempts only;

[0067] Special teams plays (kickoffs, field goals, and punt returns); and

[0068] Plays (or series of plays) in which the lead changes.

[0069] Other sports will have other playlists that apply specifically to that sport. For example, a golf match could have a "hole-by-hole playlist" where the content is rearranged by hole, and the viewer watches how every player did on that hole before viewing the next hole. Also golf might have a "Player Playlist" where all the shots from that player are shown before viewing shots from another player.

[0070] The term "playlist" is typically a continuously-viewed collection of individual video segments, each with a start and end time. However, a playlist can be formed by start times alone, without end times. These start times act as bookmarks into the video. When viewing a "bookmark-type" playlist, the user will see the entire video from start to finish, and not a subset of the video. The viewer can select

a segment, or hit the Next or Prev button, to jump to the next segment, but a bookmark-type playlist does not make these jumps automatically. It ignores segment end times and keeps playing. In mechanisms that require the end point of a segment to be known, the bookmark that marks the beginning of the next segment can be used to identify the location of the ending of the prior segment. Thus, unless otherwise apparent from the context, bookmark style playlists provide the same functions and features as playlists which include metadata that identifies both the start and ending, or the start and duration, of a segment.

[0071] It should also be noted that, while a playlist may be used to selectively play back and perhaps reorder the play back of segments, the same effects can be used by employing the metadata to actually create a concatenation of the identified segments as a revised version of the original content. Unless otherwise apparent from the context, then features and functions described in this specification can be applied to metadata playlists, bookmark playlists, or metadata edited, recorded versions of the original sports event content.

[0072] New Voiceovers

[0073] Condensed versions of games often eliminate much of the audio track, which can lead to a choppy feel to the presentation. Thus, the metadata included in a playlist may specify a new audio track to be substituted for the original audio presented with each segment. This audio track would be laid down in such a way that there were no "audio seams" that straddled segments. That is, each segment would have a standalone audio track allowing viewers to jump from segment to segment without abrupt breaks in the announcer's flow. New audio segments should be captured or created so that they do not require the context of any particular prior or following segment to be understood, enabling segments to be assembled in a variety of different ways by different playlists such as those listed above.

[0074] Navigation Features

[0075] Blind Navigation

[0076] When in Full Screen Mode (without a visible segment guide being displayed—but with the optional display of the description of the segment currently being shown), the viewer can navigate in the same fashion as in Indexed Mode (when a segment guide is displayed). That is, the viewer can cursor to another segment several segments ahead or behind using the Up or Down arrow keys on the remote, and then pressing the Select Button to view the desired segment. Instead, this navigation could be using a special Next button that is a separate, unused remote control button, or the Next button could be simply an arrow button (e.g., right arrow), without the need to press Select. The picture presentation works the same way in Full Screen Mode that it does in Indexed Mode, but the viewer can't see the name of the segments that are being navigated.

[0077] The playlist navigation mechanisms described in U.S. Pat. Nos. 5,271,811, 5,732,216, and 6,199,076 discussed in the background section above may be applied to advantage in performing blind navigation of a sports event playlist.

[0078] Replaying the Current Segment: To get to the back to beginning of the currently playing segment when in Full

Screen or Indexed Mode, the user would hit the Up arrow and then the Select button. To go back to the beginning of the previous segment for instance, the viewer would hit the up arrow twice and then the Select button. Alternatively, a special Previous button that is a separate, unused remote control button could be employed, or the Previous button could be simply an arrow button (e.g., left arrow), without the need to press Select. When the viewer presses a Previous button, the viewing jumps to the start of the previous segment. If the user is currently viewing video that is within a defined and/or configured number of seconds from the start of a segment, then the jump takes the user to the previous segment in the playlist. However, if the user is currently viewing video in excess of this defined and/or configured value, the jump takes the user to the start of the currently playing segment. This action is similar to that used in conventional CD players and DVD players when browsing and navigating the audio and video tracks on optical discs, and provides a mechanism that is familiar to viewers when applied to the navigation of segments in a playlist.

[0079] **The Next Button:** The viewer may wish to see the game in Full Screen mode without the index being visible. In this mode, the viewer can navigate blindly by skipping ahead to the next segment using the Next button, which advances the viewer ahead to the next segment. Because the Next button would be used so frequently, it is preferable to the Next button be a physical button on the remote, such as the Remote's Select button, or the Next button may be a separate, unused remote control button. Whenever the viewer hits the Select button the video would move on to the next segment while in Full Screen mode. Furthermore, when in Indexed Mode, the Select button would operate in a similar fashion. If the cursor were still on the segment being viewed, hitting the Select Button would advance the video to the next segment. If the viewer, however, had already advanced the cursor to another segment, hitting the Select button would select this highlighted segment, rather than causing the display to move to the next segment on the playlist.

[0080] **Cross Show Navigation:** The system envisions a large database of video being available to viewers consisting of all recent league games and an archive of older games. Viewers could navigate through the database via video hyperlinks displayed on the system's UI in a number of ways. For instance, when watching a Best Hits playlist from the current game, the info-box might display icons representing the players involved in the play. Clicking on these icons might offer viewers the opportunity to see great plays they made in other games. Once a viewer was watching plays from these other games, there would be further opportunities to watch parts of those respective games, or the whole game itself. Another way to navigate would be to invoke the Info button (a physical button on the remote—see below) at any time. This might present opportunities to go to other related games or parts of the video database. This sort of “chain hyperlinking” would allow viewers to peruse the database while watching actual playlists. Other navigation means would be traditional menus of the league or team schedule from which users could access specific games, or menus of cross-game playlists, such as compilations of Best Hits. The context of a scene or play could provide the basis for the hyperlinking; for instance, in the middle of watching a ski race, the user could hyperlink to see how the other skiers performed in the same section of the course currently

being viewed. For golf, this could be to see how other players fared when facing the portion of the course.

[0081] The hyperlinking itself could be invoked using a special button on the remote control. When the user is presented with an on-screen notification (alert, icon, text, graphic, etc.), pressing the button would activate the hyperlinking to another screen that shows the user the options of to where they can hyperlink (e.g., what relevant playlists are available for viewing).

[0082] Transitions Between Segments

[0083] Transition interstitials (e.g., graphics, color, audio, and/or video) may be presented to the viewer when browsing the tags within a playlist, jumping between segments (manual or automatically), or switching to another playlist. These interstitials would serve to add context to the viewing experience, so that the user has an indication of how far in time they are jumping forward (the time in question could be displayed as a graphic showing game-clock-time, broadcast-clock-time, or percentage-of-asset being viewed). Other graphical displays might be used, such as a 1 second video of a New England Patriots player rushing from one side of the screen to the other, which would be displayed immediately before the user sees the next discontiguous program segment in a New England Patriots game playlist.

[0084] The presentation of such interstitial content can accompany both manual browsing (that is, clicking on index segments or clicking the “next segment” button) as well as automatic browsing (that is, just watching a playlist and having the system automatically make the jump to the next segment). However, the latter automatic-browsing case would benefit more from the addition of the interstitial, since the user is not the one causing the jump in time, and therefore they might be lost without the context supplied by the interstitial.

[0085] Preview Mode

[0086] A user may dynamically select “Preview Mode” in which only the first part (e.g., 10 seconds) of each segment in a playlist before viewing is automatically jumped to the next segment in the playlist. If the user presses a special remote control button (or any one of a number of buttons), play can continue normally and Preview Mode would be temporarily or completely disabled. This mechanism is analogous to the “scan mode” in which car radios scan from station to station, playing each for a brief period, unless the scanning is interrupted so that the user can continue to listen to a program of interest. Alternatively, the system may play a predetermined representative portion of a segment other than the beginning which may be deemed by the metadata provider to provide a better preview of the segment. In that case, when the preview mode is interrupted, playback begins at the beginning of the segment being previewed.

[0087] Hierarchical Segment Guides

[0088] A segment guide may employ “Segment Groups” to create parent-child relationships. Segment Groups present the playlist's slugs (short on-screen descriptions of the segments in a playlist) in a hierarchy with a number of segments grouped together with a single group label. For example, all the plays within one drive of a football game (or one inning of baseball, one lap of NASCAR, one hole in golf, etc.) would be contained in a Segment Group that has

a title representing that football drive along with supplementary information, such as game clock or game quarter (e.g., "Pats Drive 1-Q2", or "Pats D1 26:30"). Overall, this serves to organize the segments, and makes it efficient for the user to peruse a long playlist by simply looking for the group in which they are interested, and then searching within that group for the play they wish to view. The relationship of Segment Groups to Segments is analogous to the relationship of file folders to files in computer file systems. By organizing segments into groups, the viewer can first search for the desired group, and then find a desired segment within that group, which is much faster than searching a single long list of segments.

[0089] Some playlists may have all segment slugs organized in Segment Groups, but other playlists may have only a portion of the segments (or none of the segments) organized in this way. Generally, the most benefit is derived from applying Segment Groups to long playlists that are associated with content that it partitioned by some construct such as innings, periods, drives, holes, laps, etc. Short content often doesn't need a segment group. For instance, a post-game news show might be only have 10 segments with 10 slugs; organizing 10 segments for easy and efficient perusal is not worthwhile since the user can browse them easily enough without the hierarchy of Segment Groups.

[0090] Two different methods for the navigation of Segment Groups are provided, and are called "bi-axial" and "show-hide."

[0091] Bi-axial navigation is commonly used to permit VOD subscribers to search for videos available for viewing, and is thus familiar to VOD viewers. Bi-axial navigation can also be applied to advantage to provide a consistent way in which viewers can browse Segments and their Segment Groups. In this application of bi-axial navigation, the user has at his/her disposal four arrow buttons on a remote control (left, right, up, down), and a select key. Using one pair of arrow buttons (either left & right, or up and down), the user can scroll through an on-screen list of Segment Groups that are arranged along the axis that correspond to the buttons they are using (i.e., left & right arrows would scroll through a horizontal list of Segment Groups, and up & down buttons would scroll vertically arranged Segment Groups titles). Once the user finds a particular Segment Group of interest (e.g., a particular drive in a football game they wish to view), they can use the other set of arrow buttons to scroll in the other axis to find a particular segment within the Segment Group (e.g., if left & right scrolls a horizontal Segment Group list, then up & down would scroll a vertical list of segment slugs that reside in that Segment Group). Once the user has located the segment of interest, they press another button (e.g., the Select button on the remote control) to select-and-view the desired segment. Segment Groups titles themselves often benefit from having a small graphic icon next to the Segment Group title to denote more information about the contents of the Segment Group, and to declare the title as being that of a Segment Group in the first place. For example, Segment Groups that are drives in a football game might have a helmet of the team with the ball placed next to the Segment Group title, which tells the user very quickly who has the ball and that it is a drive Segment Group. Another example is that if the drive ended in a touchdown, then a different icon (e.g., goal posts,

or a graphic that says "6pts") could be displayed next to the Segment Group title to denote that the drive ended in a touchdown.

[0092] Show-hide navigation is analogous to the opening and closing of file folders used to find files in a computer graphical interface, such as Windows(r). This navigation method provides a familiar way in which a viewer can locate and play particular Segments and Segment Groups in a hierarchical playlist. The viewer is shown with a list of Segment Groups titles on the screen. The user uses a pair of arrow buttons (either left & right, or up and down) to scroll to a Segment Group of interest, and then they press another button (e.g., Select button, or one of the arrow button not used for scrolling the Segment Groups) to "open" the Segment Group, thereby revealing on-screen the segments that are contained in the selected Segment Group. On-screen, the segments appear in a way that denotes to the user that the segments are contained within the Segment Group. This can be accomplished in a number of ways: listing the segments below and indented from the Segment Group title; listing the segments below and in a different color than the Segment Group; showing an icon next to the segments and/or showing an icon next to the Segment Groups with the icons being different. When the segments are shown on-screen after the Segment Group is "opened", the segments could animate into place, thereby reinforcing in the user's mind that the segments came from the action of selecting the Segment Group. When the user is done browsing and/or viewing the segments within a particular Segment Group, they have the option of either, a) actively "closing" the segment group by highlighting the Segment Group title and pressing a button (e.g., Select button, or one of the arrow button not used for scrolling the Segment Groups) thereby hiding the on-screen segments that are contained in the selected Segment Group, or b) browsing to a different Segment Group and selecting that Segment Group to "open" which cause implicitly causes the previously "opened" Segment Group to "close". Segment Group titles can have an icon next to them to denote they are a Segment Group, and the icon can change when a particular Segment Group is "opened" or "closed". For example, a "+" or sideways-facing arrow could be used when the Segment Group is "closed", and when the user selects the Segment Group to "open" it and reveal its segment contents the icon could change to a "-" or downwards-facing-arrow.

[0093] Mini-Nav Bar

[0094] The "Mini-Nav Bar" provides a further navigation method which allows a viewer to navigate when the display is in fullscreen mode (that is, the video consumes the entire screen). As noted above under "Blind Navigation," the user may navigate in full screen mode without seeing segments descriptions/titles. This isn't always optimal. In fullscreen mode, users will sometimes want to see segment descriptions to know if they care to watch the segment. Displaying the segment titles in fullscreen mode is accomplished through the "Mini-Nav Bar". This feature is a small graphic bar displayed near or at the bottom of the screen, either as an overlay on-top of the video or as a bar across the bottom that slightly vertically shrinks the video image. The graphic is either always present, or more optimally it appears only when the user presses a remote control button, which can be either a button press that explicitly brings up the Mini-Nav Bar so the user can view it, or a button press (e.g., arrow

button) used for segment browsing and the act of segment browsing automatically makes the Mini-Nav Bar appear to display the segment title being selected/browsed to. After a timeout (e.g., several seconds) the Mini-Nav Bar disappears, leaving only fullscreen video.

[0095] In the Mini-Nav Bar graphic, one or more segment titles are shown. If more than one segment title is shown, some indication is given to the user that identifies the title to which the user is browsing and/or selecting. That is, a highlight or icon or coloring or some other graphical element is used to denote the segment title that the user is about to select (or has just selected).

[0096] Alternatively, the Mini-Nav Bar may appear every time a new segment in the playlist starts to be viewed. So, instead of an explicit button press, or implicit appearance due to browsing in fullscreen mode, the Mini-Nav Bar could be displayed briefly every time the user sees a new segment. This could be entirely without user intervention, as the next segment in the playlist is shown, the Mini-Nav Bar automatically pops up to alert the user that:

[0097] (a) a new segment is going to be shown,

[0098] (b) this new segment is possibly forward in [broadcast] time of the stream, making the viewer aware of a time discontinuity in the viewed stream and

[0099] (c) the title/description of the segment that is starting to be viewed.

[0100] The manner in which the Mini-Nav bar is presented may be configured by the viewer or the provider, either dynamically or statically, to control:

[0101] a) where on the screen the Mini-Nav Bar is displayed. The Mini-Nav Bar's default position is at the bottom of the screen, but for particular types of content that has action at the bottom of the screen which would be obscured by that placement of the Mini-Nav Bar, or simply because of user preference, the graphic could be displayed in other areas of the screen.

[0102] b) the time duration after which the Mini-Nav Bar disappears may be varied. This could be set as the number of seconds that the Mini-Nav Bar is shown, and may vary depending on the amount of time which the viewer will need to read or understand the segment description presented.

[0103] c) the time after the start of the play that the Mini-Nav Bar first appears. The default behavior is to show the Mini-Nav Bar when the user causes it to appear (explicit button press, or implicit in browsing in Fullscreen mode). The user could desire that the Mini-Nav Bar not be shown until after a certain amount of time after the start of the play, so as to not ruin the suspense of what was about to happen in the play. This could be expressed as a time-after-start-of-play, or else set to show after the event described in the segment title actually occurs.

[0104] d) whether the Mini-Nav Bar automatically appears for each new segment in the playlist.

[0105] e) what segment title is shown in the Mini-Nav Bar. The user might want the suspense of the

game kept, so they may not want to see what was about to happen in the upcoming segment, as described by the segment title (e.g., "Quarterback Sacked"). The user could configure whether they wanted a more objective title shown in the Mini-Nav Bar that didn't ruin the suspense, as described above in the "Downs and Yards" playlist concept above. For example, instead of "Quarterback Sacked" the Mini-Nav Bar might be configured for suspense mode, and the user is presented with "4th and 3 yd" instead.

[0106] f) the number of segments shown in the Mini-Nav Bar could be configurable. This is particularly useful when the user has not seen the game and wants to preserve the suspense; by setting the Mini-Nav Bar to a single segment, the user will not see neighboring segment titles, which could ruin the suspense by telling the user what the next play will be.

[0107] g) the way in which multiple segment titles are arranged in the Mini-Nav Bar. If there are multiple segments displayed in the Mini-Nav Bar, the currently highlighted and/or selected segment could be in the middle, left or right end of the list of displayed horizontally segments (or middle, top, or bottom if the Mini-Nav Bar lists segments vertically). The default behavior is currently to set the highlighted and/or selected segment title in the middle of the list. This has the unfortunate side-effect of showing the viewer neighboring segment titles, which could ruin the suspense of the game. Therefore, the Mini-Nav Bar could be configured (statically or dynamically by the user) to display multiple segment titles in a different way to preserve the suspense. For example, the highlighted and/or selected segment title could be on the right side of a horizontal list. That was a user could through the Mini-Nav Bar browse to and select a segment to view, but in doing so never sees the segment one further to the right which is associated with the next play. If the segment the user browses to and selects is "4th down attempt", then they wouldn't see outcome that is described in the now-off-screen segment title.

[0108] Browsing and selecting segments in fullscreen mode with the Mini-Nav Bar could be accomplished in two ways: floating, or fixed. In the floating method of Mini-Nav Bar operation, the user is allowed to browse (e.g., with remote control arrow buttons) to a new segments before they explicitly select it (e.g., with the remote control Select button), thereby jumping to the segment of interest. In the fixed method of Mini-Nav Bar operation, every time the user browses to a new segment (e.g., with remote control arrow buttons), the jump to the new segment automatically occurs. In this way, there is no way to, say, browse and one-step jump from the first quarter to the third quarter of a football game; the operation is more like a Next button ("next, next, next, etc. etc. etc.") where each segment is seen (that is jumped to).

[0109] Interactive TV Capabilities

[0110] The Info Button: This button on the remote, on-screen commands, or voice-activated functions would allow

the user to branch to additional content from within a given segment. For instance, if the Info button were invoked while watching highlights of a given player, a short menu would appear presenting choices to see this player's highlights from other games. We envision the best way to implement this function would be to hit the right arrow key when the viewer has placed the cursor on the appropriate segment. (This is consistent with a model that using the right arrow takes the viewer to successively greater levels of details.) An "i" could appear to the right of segment slug if there was extra information about the segment to be accessed. If all segments had information, the "i" might appear at the top of the UI or not at all, but not next to every segment.

[0111] The additional information will then appear in the information panel below the picture, or in the video space, in which case the video will automatically pause while it is displayed. Hitting the left arrow key removes the additional information from the display.

[0112] Running Statistics: Some advanced viewers may be interested in having access to a continuing stream of personalized statistics. For instance, a viewer might wish to see at any moment in a game, either on-demand or in a pushed basis, statistics on: passing yards vs. rushing yards, quarterback ratings, third down conversion ratios, etc. It is envisioned that a viewer could set up a rotating sequence of such statistics with the viewer picking the statistics of interest and the order in which they would toggle through the appropriate window. The viewer could also specify at which times the video would be paused to let the statistics be viewed. Viewers could toggle through the list of statistics in one of the following ways:

[0113] 1. The one-click method would use the right arrow to toggle through the various angles (under the theory that the camera angles represent another level of detail about the video.). The Info use of this button would be terminated and that function could be accessed from an on-screen command.

[0114] 2. Toggling through the Favorite button (if there is one)

[0115] 3. Toggling through one of the A, B, C buttons

[0116] 4. The various options could be offered as a menu in the banner ad space.

[0117] Look-Ahead Stories: A certain type of running statistical story would be feasible under a time-shifted scenario—one where the end of the story was known by the system in advance. Thus, if a running back ended up breaking, or coming close to breaking, a record by the end of the game, the system would know that outcome in advance and start to develop that storyline earlier than a live announcer would. Viewers would have the advantage of having displayed for them early in the game a chart showing total yards per-moment in the game versus the record. They would therefore be tipped off that this is a major story without knowing the outcome. Viewers watching the video for the second time, or ones who knew the outcome would have the benefit of following the storyline right from its inception. Whether the record is broken or not, the comparison is fun to watch right up to the end.

[0118] Segment-Related Content: Another use would be to use this space to provide a short narrative of what transpired

in that particular segment. The text in this space could either be in addition to the segment "slug" (short on-screen segment description normally shown in a list), or could be a continuation of the slug. That is, when a segment is selected and/or highlighted, the first part of the description could be the short description in the segment index listing, and the remaining portion could be the continuation of text in the information area. If the information area is used for text or a narrative describing the segment, this area could be scrollable (i.e., via remote control arrow buttons) by the user if all the text did not fit on the screen, or the application could automatically scroll the text (much like the horizontally moving banner text now often used on news and sports broadcasts, but provided by metadata as part of the playlist).

[0119] Chalk Talks: Another segment-related use of interactive TV would be to display a "chalk talk" before, during or after a play. Such diagrams, as illustrated at 209 in FIG. 2, outline for viewers how a play work, who runs where and who covers whom on defense. Typically, the chart is comprised of "X's" and "O's". Such a diagram could be called up through use of the Info button mentioned above. A chalk talk diagram could also be dynamic. As opposed to a real chalk diagram, which is static, the disclosed system could show the X's and O's in motion as the play progress and even have accompanying audio explaining the play. The game video could be running at the same time. If the chalk talk window was in "focus", the pause and rewind buttons could be applied to reviewing the dynamic graphic. A chalk talk could include an audio analysis of the play along with on-screen graphics that are on-top of the video, much like sportscasters now often use pen-drawn on-screen graphics in football replays. This could take the form of a secondary audio, video, and/or graphics track (much like a secondary audio track of a DVD) that the user can turn on/off at any time via an on-screen toggle or remote control button. In addition to being dynamic, the diagram could also be interactive. Viewers could toggle over to the window displaying the diagram and once this window was in focus, the arrow keys could be used to highlight different players. Clicking on a player would bring up information on that player.

[0120] Drive Diagrams In addition to play-specific chalk talks, the system could also offer "drive diagrams" that graphically show the movement of the ball up and down the field. This type of graphic gives the user a "big picture" perspective on the game and would be particularly interesting to viewers watching the condensed game playlists. Viewers would be able to navigate through the video content using these diagrams by first toggling over to the window containing the diagram. Using the arrow keys, viewers could highlight the desired drive and click on it and thus bring up the video associated with the start of that drive.

[0121] "Learn The Game" Mode: When a viewer is new to football, or any other sport, it is often hard to learn the game. Using the broadcast itself as a learning medium has two disadvantages—it has to progress at the rate of the live game, limiting the amount of time available to explain events in detail, and it is a one-size-fits-all production, meaning it can't be tailored for the fraction of the audience that is not up to speed on details of the game. With time-shifting and pause capability, the viewer is able to put the system into "learn mode". In Learn mode, information is conveyed two ways.

[0122] For situations where the viewer “pulls” information from the system (i.e. using the Info button), the system would understand that viewer is trying to learn the game and offer the appropriate information as a result. In other situations the system is “pushing” information to the viewer, for instance when the ad banner box is filled with data that the viewer did not necessarily request. In this case, as well, the information would be tailored to the user’s level of knowledge.

[0123] The information presented could be text, a graphic, a dynamic graphic, or a video clip. The information could also be “standard” or “custom”. Standard information would be static data prepared well in advance and used for multiple games. Custom information would be data created to be associated with a specific moment in a specific game. For instance, a standard video clip could be a video clip showing a typical “face mask” infraction while a custom clip for the same topic could be an edited segment of the currently watched game (that is, a replay of the face mask penalty that was just watched). All these forms of information could be presented on either a push or pull basis. This static database of helpful hints could also be accessed at will through a more elaborate menu scheme. That is, if viewers wished to understand what a clipping penalty was, they wouldn’t have to wait for one to occur, but instead would have the option of going to, say, the Options menu, and ferreting out the clip or text explaining this penalty.

[0124] Advanced Viewer Mode: In the same way that new football fans would want explanatory metadata about the game, experienced viewers might wish to have more advanced levels of data presented. To this extent, the system would also offer a similar Advanced Mode.

[0125] Some of the advanced statistics that might be offered include a summary of penalties so far in the game, a frequency table of which types of plays had been called so far, and a comparison of the types of yardage accumulated by each team.

[0126] Games for Viewers: Viewers would also be able to use the system’s time-shifted interactive TV functionality to participate in games. In particular, they could pause the picture and enter a “Guess the Play” contest where a multiple-choice question would appear in the information area. Users would toggle to the area and navigate to their selected answer. A bet could be placed in jurisdictions that allowed gambling. In other locations, a virtual bet could be placed where the system would keep track of how much virtual money a viewer had won-such monies being exchangeable for prizes. Other games would involve multiple-choice trivia games.

[0127] IP-Based Interactivity: The system may use an Internet connection to retrieve and display text and image data from the web on the information panel alongside the cable-based main video window, or on the full screen. In this mode, the remote and the television may effectively operate as a web browser to allow the user to interactively locate detailed information to which the metadata provides contextual links, participate in games and chat sessions, etc.

[0128] When a viewer brings up an information screen, or supplemental programming of any kind, that will become the new focus of attention, the current video presentation should be automatically paused while the user is viewing the

requested material. When the user exits this presentation, the video should be automatically put back into Play mode.

[0129] Similarly, if the user optionally clicks out (via clicking on the banner ad) to an ad video, the original video that they were watching should be paused and/or bookmarked. When the ad viewing is completed, the user re-joins the original video from the point where they clicked the ad.

[0130] Both of these speak to the idea of “pausing” at the point of OPTIONAL departure from the original on-demand content, so that the user returns to the same place.

[0131] Additional System Capabilities

[0132] Masking Outcomes

[0133] Often a viewer will not know, nor want to know, the score of the time-shifted game being reviewed. If the user wishes to be “kept in suspense,” that preference should be ascertained as soon as the viewer entered the game presentation environment. If that preference is expressed, the system will endeavor to mask the outcome of the game from the viewer in one of several ways:

[0134] The first technique would have the system not display the to-be-seen portions of the playlist, only listing segments already viewed. In this mode, the viewer would pick the playlist to watch and let it progress in a linear way, only randomly accessing and replaying already-viewed segments, or using the Next button to jump ahead-but only a segment at a time. A segment is not listed in the Index until it has been viewed in its entirety or the viewer has skipped ahead. (If a segment label is displayed in advance, it might well give away the storyline.

[0135] A second method would involve using labels for segments that did not contain scoring information. This approach allows a viewer to jump ahead more easily but can still give away a sense of the game by virtue of merely seeing who has the ball, when a kickoff is made, etc.

[0136] Using a third method, the system could actually change the segment title that is displayed once the user sees the segment, as described in relation to the Mini-Nav Bar, above. For example, the user might want the suspense of the game kept, and not want to see what was about to happen in the upcoming segment, as described by the segment title (e.g., “Quarterback Sacked”). Consequently, before the segment is shown, a more objective title is shown that won’t ruin the suspense (e.g., “4th and 3 yd”). After viewing the segment, the more descriptive segment title that describes the outcome of the outcome would be presented.

[0137] Multiple Camera Angles

[0138] Although the system can be used to advantage to re-use, simplify, condense, or more easily navigate standard broadcast content, it may also be used to expand on the coverage available in an original broadcast. Additional footage could be obtained from systems designed for multiple camera angle use, network cameras whose shots were not broadcast at a given time; stadium cameras; and league cameras shooting footage for the coaches. While multiple cameras may be used to shoot any one given play, only one can be shown to viewers during normal broadcasts. A second or third, however, could be used during replays. In a VOD environment, however, video from more than one camera angle could be stored on the server. The system’s default

camera angle would be the one used in the broadcast, however, by invoking a command, viewers would be able to select from a menu of available camera angles whenever those were available. It is envisioned that various methods could be implemented to let viewers access the multi-angle feature. These options are similar to those described above for allowing advanced users toggle through a list of statistical presentations. The user could specify the order of which the angles would appear when toggling by going to the set-up section of the Option menu. Each time the Right Arrow (if this was the method of toggling) was hit, the segment would start playing over again using the camera angle first on the list. Viewers could also specify camera angles by type of play or player featured, a feature that can't be offered to live viewers. For instance, a viewer could set up the system so that field goals are always shown with the camera behind the goal posts. Hail Mary passes would always be shown by stepping the camera back to capture the whole field. This latter example would offer the additional drama of tipping the viewer off that a dramatic moment was being set up.

[0139] Picture in Picture

[0140] A PIP (picture-in-picture) mode presents to or more games at the same time on the same screen. Multiple windows of video may be shown in a picture-in-picture fashion, or one game could be displayed in the main window while one or more secondary video feeds (either different games, or other programming) could be shown in the information space, or some other subsidiary window. Multiple views of the video would be useful in situations showing the game in the main window, while having the cheerleaders, crowd, or coaches shown in the information space. Alternatively, an entirely different game could be shown in the subsidiary window. The user could set up the presentation formats in an Options menu. Once set up, the viewer would then have different viewing "universes" controlled by one remote. When users invoked the standard navigation features such as pause, rewind, or fast-forward, the commands would apply to all the open windows at once (if the programming in the supplemental windows is associated with the context provided by the video feed in the main window. Alternatively, time shifting commands may be applied only to the window that is "in focus." Multiple camera angles could be invoked in each window in the ways described above. The viewer would have to toggle over to the respective window first, to put it in "focus", at which point the different cameras could be invoked.

[0141] Another possibility for a PIP setup would allow viewers to have more control over the source of the subsidiary images within or adjacent to the main video. Besides other cable broadcast sources (i.e., another game), a video feed or other presentation off the web to be used in the PIP (picture in picture display window). In this way, every viewer could have a unique viewing construct. In particular, relating to sports, a viewer would be able to "rent" a webcam that he or she could control. Thus, if friends were attending a camera, a community could be constructed by keeping a webcam trained on their seats while the game progress.

[0142] Multiple Audio Feeds

[0143] In addition to multiple camera angles, the system could also offer multiple audio feeds. Viewers could select the standard TV broadcast feed, as well as a radio broadcast

feed or the audio broadcast at the stadium. In addition, users could overlay the stadium sound on any given feed for added effect. Another feed could be the audio captured from an on-field mike or a player's helmet. Viewers from different locations may want to select different radio broadcast feeds (e.g., viewers can get the feed of their home-town or favorite announcer).

[0144] As described in detail in more detail in U.S. patent application Publication 2003/0093790 A1 published on May 15, 2003. the system may employ a "community markup" mechanism that allows users to create special playlists (using the bookmarking feature), and then transmit those playlists to other users who may then view programming under the control of the supplied playlist. As analogous concept is "community audio" whereby one or more viewers, for compensation or for free, would offer their commentary on a game. Thus, a high school coach could add his spoken comments on game in the system for benefit of his players, or a team player could offer his thoughts. In another case, a celebrity could offer his or her comments. Versions could be created that included comedic comments overlaid on part of the game in the same way that some music video stations offer Pop-Up comments during music videos. In another special version of audio, the new announcer, knowing the outcome of a play and the whole game, could give subtle hints as to what to watch.

[0145] Another feature could be the use of audio conferencing, so that viewers could enjoy watching a sporting event in the "virtual" presence of friends and family. The audio conferencing could be accomplished via regular phone, Internet link, or Voice-Over IP, all played through the set-top box and/or television audio.

[0146] Dynamic Configuration

[0147] The system may dynamically configure the playback for the amount of time a viewer indicates that he or she want to spends watching a particular video or playlist (e.g., setting the system to 22 minutes for a football game viewing session; setting for a "Slow", "Medium", or "Fast" viewing time on a Highlights Playlist; etc.). With this information, the system could select the playlist with the closest running time to what the user indicated they wished to spend viewing the video. Alternatively, the system could dynamically change a playlist's segment time or number of segments so that the viewer is presented with an overall running time that approximately matches their desired viewing time.

[0148] Additionally, the system could have an on-screen option (or a remote control button) that allows the user to request a speed up or slow down in the viewing experience. With this input, the system would dynamically alter the playlist being watched, or else could dynamically change the current playlist's segment times or number of segment, so that the viewer is presented with an overall running time that appropriately matches their desires.

[0149] Features Adapted to Sports Events

[0150] Other features described in detail in the patents and published applications noted in the background section above, may be adapted to sports programming.

[0151] The Vault function, invoked by clicking on the "V" button on the toolbar 220 seen in FIG. 2, allows viewers to add the segment currently being viewed (or highlighted on

the displayed segment guide) and save them to a virtual personal storage area called the "vault." For a VOD system, such action does not result in the actual copying of the video to a separate location, but merely the storage of metadata that signifies that a segment stored on the central server has been "virtually" stored by the viewer. In a PVR system, the vault may contain a copy of the selected segment, or any segment in an identified program stored in the PVR may be copied before that program is erased. Certain segments can be designated as "highlights" and be automatically sent to a viewer's vault. The viewer could program the system to save these highlights by player, Fantasy Football roster, team, play-type, etc.

[0152] Bookmarking, invoked by clicking on the "P" button on the toolbar 220 seen in FIG. 2, allows viewers to bookmark the game themselves. This would take the form of bookmarking segments or creating new metadata serving as a new jump-to location. Alternatively, a viewer could delineate their own segment by bookmarking the beginning and end of a segment. These segments could be dropped into the Vault. Bookmarks may be associated with specific viewers.

[0153] Advertising associated with the broadcast of a sports event may be available to view in the sports presentation system. To encourage ad viewing, bookmarks denoting a new segment at the beginning of ads would provide an incentive for viewers to watch ads. Furthermore, the system may require viewers to watch ad content in proportion to the game content viewed. Consumers could opt out of this requirement by paying an extra subscription fee. Under any model, the fast-forward button may be disabled, disabled to prevent skipping over ad content that is associated with a segment, or slowed to discourage ad skipping. Another method to foster some limited ad viewing would be to require that the viewer click the "Next" button several times to get past an ad, with each click taking the viewer to a new position within the ad. The navigation could even be suspended for a brief period at each "stop" to allow the viewer to absorb some part of the ad content. The metadata may mark certain segments as mandatory, preventing them from being skipped except to skip to an entirely different segment, and in this way requiring that ad content be viewed as a condition for viewing designated program content. The metadata could be used to place "required viewing" attribute(s) in ad segments to maximize their effectiveness without hindering the "navigational progress" of the viewer more than necessary.

[0154] Conclusion

[0155] It is to be understood that the methods and apparatus which have been described above are merely illustrative applications of the principles of the invention. Numerous modifications may be made by those skilled in the art without departing from the true spirit and scope of the invention.

What is claimed is:

1. A method for presenting recorded sports broadcasts which comprises, in combination, the steps of:

recording a live sports event to create a video program stored in a program storage device,

creating a metadata playlist which identifies and describes each of a plurality of segments of said video program as stored,

transmitting said metadata playlist to a presentation device,

displaying a segment guide containing information from said playlist on said presentation device, said segment guide including elements which identify at least selected ones of said plurality of segments,

employing a control device operated by a viewer and coupled to said presentation device for selecting a specified one of said elements,

retrieving the particular segment identified by said specified one of said elements from said storage device,

transmitting said particular segment to said presentation device,

and displaying said particular segment for said viewer on said presentation device

2. A method for presenting recorded sports broadcasts as set forth in claim 1 wherein each of said plurality of segments substantially excludes any portion of video program recorded when said sports event was not in active play.

3. A method for presenting recorded sports broadcasts as set forth in claim 1 wherein said metadata playlist is one of a group of metadata playlists, each of which identifies and describes a different plurality of segments of said video program as stored, said method further comprising the steps of displaying a description of each playlist in said group and accepting a designation of said metadata playlist from said control device operated by said viewer.

4. A method for presenting recorded sports broadcasts as set forth in claim 3 wherein said plurality of segments designated by said playlist comprise substantially less than all of said video program whereby viewing said plurality of segments designated by said playlist provides said viewer with a condensed version of said sports event.

5. A method for presenting recorded sports broadcasts as set forth in claim 4 wherein each of said plurality of segments substantially excludes any portion of video program recorded when

6. A method for presenting recorded sports broadcasts as set forth in claim 1 wherein said sports event is a football game and wherein each element of said segment guide describes one or more plays in said football game.

7. A method for presenting recorded sports broadcasts as set forth in claim 6 wherein most of said plurality of segments substantially excludes any portion of said video program recorded when said football game was not in active play.

8. A method for presenting recorded sports broadcasts as set forth in claim 7 wherein most of said plurality of segments of said video program were recorded when the football was in motion.

9. A method for presenting recorded sports broadcasts as set forth in claim 7 wherein most of said plurality of segments substantially excludes any portion of said video program recorded when the official timekeeper's clock for said football game was not in motion.

10. A method for presenting recorded sports broadcasts as set forth in claim 6 wherein said plurality of segments are each devoted to only those events in the football game that are selected by one or more human editors as being more important than the remainder of the events in said football

game whereby said playlist presents a condensed version of said football game for said viewer on said presentation device.

11. A method for presenting recorded sports broadcasts as set forth in claim 1 wherein said video program stored in said storage device is subdivided into segments each of which is associated with attribute data and wherein each of said plurality of segments identified by said metadata playlist is associated with attributed data having defined characteristics.

12. A method for presenting recorded sports broadcasts as set forth in claim 11 wherein said attribute data identifies

persons who participated in that portion of the sports event depicted by each segment, and wherein the attribute data for each of said plurality of segments identified by said playlist identifies a particular person.

13. A method for presenting recorded sports broadcasts as set forth in claim 11 wherein said attribute data identifies one or more categories within which said segments may be classified, and wherein the attribute data for each of said plurality of segments identified by said playlist identifies a specific one of more of said categories.

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United States Patent [19]**Wanderscheid et al.****[11] Patent Number:** **5,602,582**
[45] Date of Patent: **Feb. 11, 1997**

[54] **METHOD AND SYSTEM FOR PROCESSING A REQUEST BASED ON INDEXED DIGITAL VIDEO DATA**

[75] Inventors: **Tammy M. Wanderscheid**, Highland Ranch; **Martin D. Siebring**; **Kurt P. Haldeman**, both of Aurora, all of Colo.

[73] Assignee: **U S West Marketing Resources Group, Inc.**, Engelwood, Colo.

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[58] **Field of Search** **348/6, 7, 8, 12, 348/13, 4; 455/3.1, 3.2, 4.2, 5.1, 6.1, 6.2, 6.3; 395/155, 161; H04N 7/10, 7/173, 7/16**

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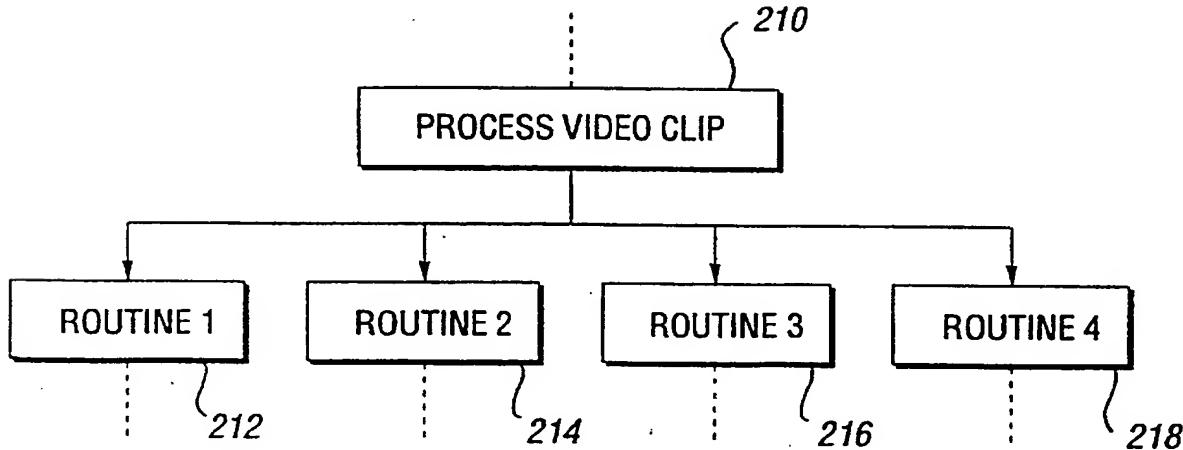
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Primary Examiner—David E. Harvey
Attorney, Agent, or Firm—Brooks & Kushman

[57] **ABSTRACT**

A method is disclosed for processing an input signal related to streamed digital video data. The method is directed to an interactive media network employing a client-server architecture. The method begins with initializing a counter. The counter may represent an elapsed time or a frame number. Next, the client station receives streamed digital video data representing multimedia information. The counter is then updated and the multimedia information represented by the streamed digital video data is displayed. Next, the input signal representing a user request is received at the user station. An index based on the value of the counter is then determined, and the method concludes by transferring execution control based on the index. A system is also disclosed for processing the steps of the above-described method.

18 Claims, 2 Drawing Sheets



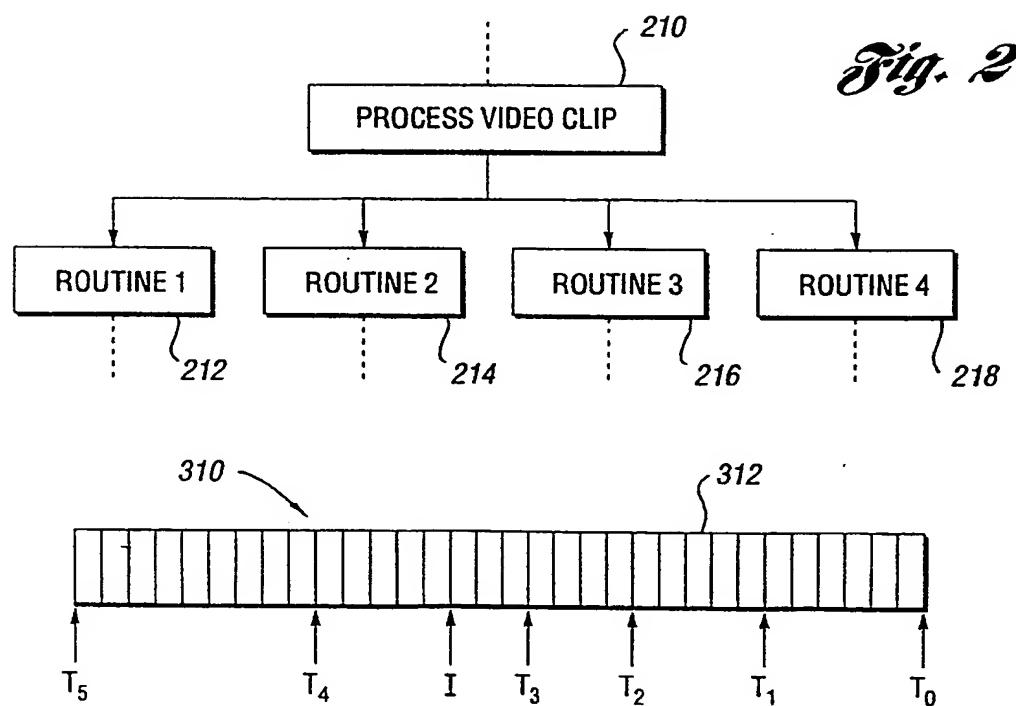
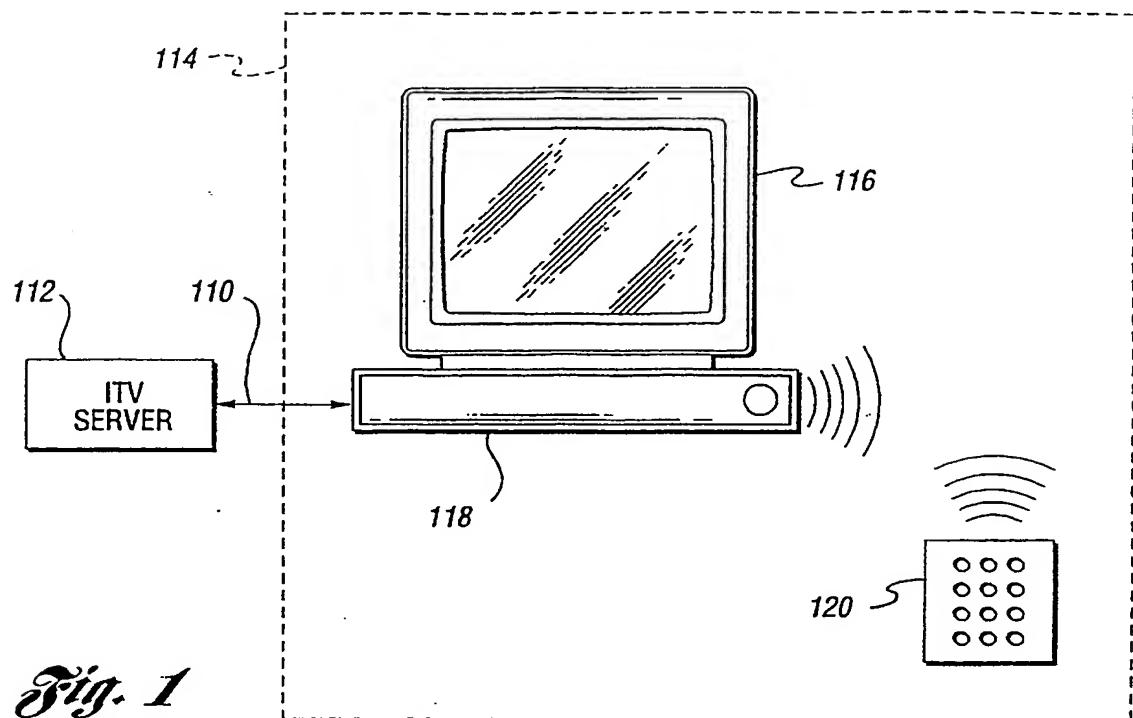
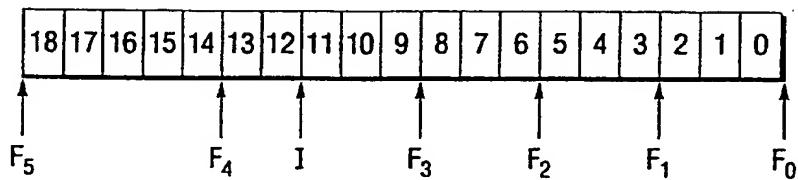


Fig. 3

Fig. 4

TIME INDEX	BATCH INSTRUCTION
T ₁	JUMP TO ROUTINE 1
T ₂	JUMP TO ROUTINE 2
T ₃	JUMP TO ROUTINE 1
T ₄	JUMP TO ROUTINE 3
T ₅	JUMP TO ROUTINE 4

*Fig. 5**Fig. 6*

FRAME INDEX	BATCH INSTRUCTION
F ₁	JUMP TO ROUTINE 1
F ₂	JUMP TO ROUTINE 2
F ₃	JUMP TO ROUTINE 1
F ₄	JUMP TO ROUTINE 3
F ₅	JUMP TO ROUTINE 4

Fig. 7

FRAME INDEX	USER BUTTON	BATCH INSTRUCTION
F ₁	1	JUMP TO ROUTINE 1
F ₁	2	JUMP TO ROUTINE 2
F ₁	3	JUMP TO ROUTINE 3
F ₁	4	JUMP TO ROUTINE 4
F ₂	1-4	JUMP TO ROUTINE 2
F ₃	1-4	JUMP TO ROUTINE 1
F ₄	1-4	JUMP TO ROUTINE 3
F ₅	1-4	JUMP TO ROUTINE 4

**METHOD AND SYSTEM FOR PROCESSING
A REQUEST BASED ON INDEXED DIGITAL
VIDEO DATA**

TECHNICAL FIELD

This invention relates generally to methods and systems for processing user requests during a multimedia presentation. In particular, this invention relates to methods and systems for dynamically transferring program control based on an input signal received during a multi-media presentation.

BACKGROUND ART

Methods for digitally representing video signals have existed for at least 30 years. Digital representations of video signals typically require a very large number of bits.

For example, uncompressed digital video data representing sixty seconds of video requires approximately 1.6 gigabytes of digital storage. Sixty seconds of compressed video can be stored in approximately 20 megabytes. Generally, the widespread use of digital video data in interactive applications has been limited by the massive amount of storage required for such data.

Recent advances in not only video compression algorithms but also manufacturing processes relating to digital storage devices have made digital video data available for an increasing number of applications. One such application is interactive media.

The concept of interactive television, for example, has existed for many years. However, only recently, with the availability of digital video data, have a number of small interactive television networks been developed. These interactive television networks utilize compressed digital video data which is indexed to ensure synchronization between the visual and audio aspects of a video clip.

Typically, interactive television networks provide a user with the ability to select functions using a remote control or similar pointing device. During the presentation of a video clip, the user is limited to a predetermined and static set of functions from which to select. At any time during the presentation of a video clip, regardless of the content of the video clip, the user may select a function. Program control is accordingly transferred to a routine based on the selected function.

Dynamic functionality, however, is not presently available to users of such interactive television networks. In other words, the set of available functions does not change during a contiguous stream of digital video data. As a result, the selections available to a user are fixed throughout the display of a video clip.

Consequently, a need has developed for an improved method and system for processing a user request which, unlike the prior art, is related to streamed digital video data. More particularly, a need has developed for a method and system for processing a user request in an interactive media network which supports a dynamic set of functions based on an indexing of a video clip.

DISCLOSURE OF THE INVENTION

The present invention disclosed and claimed herein comprises a method and system for processing an input signal representing a user request related to indexed digital video data in an interactive media network such as an interactive television network.

It is therefore an object of the present invention to provide a method and system for processing an input signal representing a user request related to digital video data which is indexed based on either time or frame number.

5 It is another object of the present invention to provide a method and system for processing an input signal representing a user request which can be used in many different applications and environments of such interactive media networks.

10 In carrying out the above objects and other objects, features and advantages of the present invention, a method is provided for processing an input signal representing a user request related to streamed digital video data. The method is directed for use in an interactive media network such as, for example, an interactive television network which includes a server and at least one client station. Each client station includes a processor, a memory and an input device, such as an infra-red remote controller.

15 The method begins with the step of initializing a timer. The method also includes the step of transmitting streamed digital video data from the server to a client station. The digital video data represents a video clip to be displayed on the monitor of the client station. The method further includes the step of displaying the streamed digital video data on the monitor of the client station.

20 The method continues with the step of receiving a signal from the input device of the client station. The input signal represents a user request related to the video displayed on the monitor of the client station. The method next includes the step of determining an index based on the timer. Finally, the method includes the step of transferring execution control to an appropriate routine based on the value of index.

25 In further carrying out the above objects and other objects, features and advantages of the present invention, a second preferred method is provided for processing an input signal related to streamed digital video data. The method includes the step of initializing a frame counter. The method also includes the step of receiving streamed digital video data at a user station. The method further includes the steps of updating the frame counter and displaying the streamed digital video data on the monitor of the user station.

30 The method continues with the step of receiving the input signal from the input device. The input signal represents a user request related to the video displayed on the monitor of the client station. The method concludes with the steps of determining an index based on the frame counter and transferring execution control to an appropriate routine based on the value of index.

35 In further carrying out the above stated objects, features and advantages of the present invention, a system is also provided for carrying out the steps of the above described methods.

40 The objects, features and advantages of the present invention are readily apparent from the detailed description of the best mode for carrying out the invention when taken in connection with the accompanying drawings.

60 BRIEF DESCRIPTION OF THE DRAWINGS

45 A more complete appreciation of the invention and many of the attendant advantages thereof may be readily obtained by reference to the following detailed description when considered with the accompanying drawings in which reference characters indicate corresponding parts in all of the views, wherein:

FIG. 1 is a schematic block diagram of the environment in which the present invention is used;

FIG. 2 is a flowchart of a program segment related to processing user input received during the presentation of a video clip;

FIG. 3 is a functional block diagram of streamed digital video data indexed based on time;

FIG. 4 is a lookup table used in association with time indexed streamed digital video data;

FIG. 5 is a functional block diagram of streamed digital video data indexed based on frame number;

FIG. 6 is a lookup table used in association with frame number indexed streamed digital video data; and

FIG. 7 is a lookup table used in association with indexed streamed digital video data and a remote control button index.

BEST MODES FOR CARRYING OUT THE INVENTION

Referring now to the drawings, FIG. 1 is a schematic block diagram illustrating an interactive media system for use with the present invention. The system is shown as an interactive television system and includes an interactive television ("ITV") server 112 for use in an interactive television network. ITV server 112 is provided in electrical communication with Customer Premises Equipment ("CPE") device 114 of the subscriber over communication line 110. Communication line 110 is preferably, but not necessarily, a fiber optic cable.

The preferred CPE device 114 of the present invention is a Time Warner full service network Home Communications Terminal ("HCT"). The HCT employs a MIPS R4000 chip running at 80-100 Mhz and incorporates Silicon Graphics Indigo Workstation components. The HCT is designed to receive digital full motion video, animation, graphics and audio. The HCT is further designed to convert this digital information into an analog signal for transmission to monitor 116.

CPE 114 includes a display device or monitor 116. To provide the highest resolution, display device 116 is preferably a video monitor however, a standard television is acceptable. CPE 114 further includes interactive television controller 118 having a processor and memory. CPE 114 also includes input device 120. Preferably input device 120 is an infrared remote control including a number of alpha-numeric keys to facilitate user selection. Alternatively, input device 120 could be an infrared mouse.

As those skilled in the art will recognize, system 10 is an interactive television network employing a client-server architecture. ITV server 112 provides mass storage and services to CPE 114. Control logic resides at both server 112 and CPE 114 to support the client-server architecture.

Although the preferred embodiment will be described for use in an interactive television environment, the present invention is equally well-suited to a CD-ROM interactive system, a stand alone kiosk for use in a public facility, or any other such interactive multi-media information system. In addition, it is envisioned that the method of the present invention is well-suited to a variety of input devices. The method of the present invention is envisioned to operate with a touch sensitive screen, joy stick, mouse, or other conventional input device.

Referring now to FIG. 2, there is illustrated a flowchart of a program segment related to processing user input received

during the presentation of a video clip. Block 210 represents the steps associated with processing and presenting the video clip. These processing steps include receiving streamed digital video data at the client CPE 114; presenting video information at monitor 116; identifying a user request input using input device 120; and transferring execution to an appropriate routine based on the identified user input and the portion of the video data being presented at the time of the user input.

Blocks 212-218 represent processing steps associated with routines responsible for processing user requests. As indicated above, these routines assume execution control based on the identified user input and the portion of the video data being presented at the time of the user input.

Referring now to FIG. 3, there is shown a diagram illustrating time indexed streamed digital video data. The data stream representing a video clip is generally referred to by reference numeral 310. The data stream comprises data blocks representing video frames. A block of data representing a single frame is illustrated by reference numeral 312.

Time index T_0 identifies the beginning of the data stream 310. Time indices T_1-T_5 identify relevant transition points within the video clip. These indexed transition points may relate to a change in subject matter, audio/video instructions, or any other change which would necessitate an alternative input signal processing routine.

As an example, data stream 310 might represent a video clip promoting merchandise in a women's clothing store. The portion of the video clip from T_0 to T_1 might be a segment which generally introduces the merchandise of the store. The second segment of the video clip from T_1 to T_2 might describe a first department within the store, such as an accessories department. The third segment of video clip 310 between T_2 and T_3 might describe a second department within the store, such as a clothing department. The fourth segment of video clip 310 between T_3 and T_4 might describe a third department within the store, such as a jewelry department. The final segment of video clip 310 between T_4 and T_5 might describe a fourth department within the store, such as a footwear department.

A user input signal is identified during data stream 310 at time I. Upon receiving the input signal from remote controller 120, CPE 114 will determine a time index based on I.

Referring now to FIG. 4, there is illustrated a look-up table used in association with the time indexed streamed digital video data. Continuing the previous example, the input signal is received by CPE 114 at time I between T_3 and T_4 . Accordingly, CPE 114 uses T_4 to index into the look-up table of FIG. 4. Preferably, the timer and the look-up table reside in the memory of CPE 114.

After the look-up is performed, CPE 114 executes a branch instruction associated with the T_4 entry. In this example, a user generated input signal received by CPE at time I would result in CPE 114 transferring execution control to routine 3. The branch instruction could incorporate any execution transfer programming technique. Examples include case and switch statements, if-then-else statements and GOTO statement.

Referring now to FIG. 5, there is shown a diagram illustrating frame indexed streamed digital video data. The data stream representing a video clip is generally referred to by reference numeral 510. The data stream comprises data blocks representing video frames. A block of data representing a single frame is illustrated by reference numeral 512.

Frame index F_0 identifies frame 0, the first frame of the data stream. Frames can be indexed as either intra picture

frames or predicted picture frames without adversely effecting the results of the invention. Frame indices T_1-T_5 identify relevant transition points within the video clip. These indexed transition points are similar to those shown in FIG. 3 except that they are identified by frame number instead of time.

As in the previous example, streamed digital data 510 might represent a video clip promoting merchandise in a women's clothing store. The portion of video clip 510 from F_0 to F_1 might be a segment which introduces the merchandise of the store. The second segment of video clip 510 from F_1 to F_2 might describe a first department within the store, such as an accessories department. The third segment of video clip 510 between F_2 and F_3 may describe a second department within the store, such as a clothing department. The fourth segment of video clip 510 between F_3 and F_4 might describe a third department within the store, such as a jewelry department. The final segment of video clip 510 between F_4 and F_5 might describe a fourth department within the store, such as a footwear department.

A user input signal is identified during data stream 510 at frame 1. Upon receiving the input signal from remote controller 120, CPE 114 will determine a frame index based on 1.

Referring now to FIG. 6, there is illustrated a look-up table used in association with the frame indexed streamed digital video data. As shown in FIG. 5, the input signal is received by CPE 114 at frame 1 between F_3 and F_4 . Accordingly, CPE 114 uses F_4 to index into the look-up table shown in FIG. 6. Preferably, the timer and the look-up table reside in the memory of CPE 114.

After the look-up is performed, CPE 114 executes a branch instruction associated with F_4 . In this example, a user generated input signal received by CPE at time 1 would result in CPE 114 transferring execution control to routine 3. The branch instruction could incorporate any execution transfer programming technique. Examples include case and switch statements, if-then-else statements and GOTO statements.

Referring now to FIG. 7, there is illustrated a look up table having two indices: a frame index, and a user button index. A look up table such as this can be used in embodiments providing functionality for several buttons during a video clip segment.

As illustrated during the video clip segment ending at frame index F_1 , buttons 1-4 are associated with different processing routines. For video segments associated with frame indices F_2-F_5 , buttons 1-4 are associated with the same processing routine.

While the best modes for carrying out the invention has been described in detail, those familiar with the art to which this invention relates will recognize various alternative designs and embodiments for practicing the invention as defined by the following claims. Using a look up table employing multiple indices provides an application developer the ability independently alter the functionality of any button of remote controller 120 at any frame index during the video clip.

What is claimed is:

1. In an interactive media network including a server and a client station, the client station including a processor, a memory and an input device, a method for processing an input signal from the input device relating to streamed digital video data, the method comprising:

initializing a timer;

transmitting streamed digital video data from the server to the client station, the streamed digital video data rep-

resenting multimedia information and having a plurality of execution control routines associated therewith; displaying the multimedia information at the client station based on a first one of the plurality of execution control routines;

receiving the input signal from the input device of the client station, the input signal representing a user request;

determining an index based on the timer upon receipt of the input signal;

selecting a second one of the plurality of execution control routines based on the index; and

displaying the multimedia information at the client station based on the second one of the plurality of execution control routines.

2. The method of claim 1 wherein the interactive media network is an interactive television network.

3. The method of claim 1 wherein the step of selecting a second one of the plurality of execution control routines includes the step of determining a program control memory address based on a lookup table.

4. The method of claim 1 wherein the step of determining an index includes the step of identifying the user request.

5. In an interactive media network including a plurality of user stations, each user station including a processor, a memory and an input device, a method for processing an input signal from the input device relating to streamed digital video data, the method comprising:

initializing a frame counter;

receiving streamed digital video data at the user station, the streamed digital video data representing multimedia information and having a plurality of execution control routines associated therewith;

updating the frame counter;

displaying the multimedia information at the user station based on a first one of the plurality of execution control routines;

receiving the input signal from the input device of the client station, the input signal representing a user request;

determining an index based on the frame counter upon receipt of the input signal;

selecting a second one of the plurality of execution control routines based on the index; and

displaying the multimedia information at the client station based on the second one of the plurality of execution control routines.

6. The method of claim 5 wherein the interactive media is an interactive television network.

7. The method of claim 5 wherein the frame counter relates to intra picture frames.

8. The method of claim 5 wherein the frame counter relates to predicted picture frames.

9. The method of claim 5 wherein the step of selecting a second one of the plurality of execution control routines includes the step of determining a program control memory address based on a lookup table.

10. The method of claim 5 wherein the step of determining an index includes the step of identifying the user request.

11. In an interactive media network including a server and a client station, the client station including a processor, a memory and an input device, a system for processing an input signal from the input device relating to streamed digital video data, the system comprising:

means for initializing a timer;

means for transmitting streamed digital video data from the server to the client station, the streamed digital video data representing multimedia information and having a plurality of execution control routines associated therewith;

means for displaying the multimedia information at the client station based on a first one of the plurality of execution control routines;

means for receiving the input signal from the input device of the client station, the input signal representing a user request;

means for determining an index based on the timer upon receipt of the input signal;

means for selecting a second one of the plurality of execution control routines based on the index; and

means for displaying the multimedia information at the client station based on the second one of the plurality of execution control routines.

12. The system of claim 11 wherein the means for selecting a second one of the plurality of execution control routines includes means for determining a program control memory address based on a lookup table.

13. The system of claim 11 wherein the means for determining an index includes means for identifying the user request.

14. In an interactive media network including a plurality of user stations, each user station including a processor, a memory and an input device, a system for processing an input signal from the input device relating to streamed digital video data, the system comprising:

means for initializing a frame counter;

means for receiving streamed digital video data at the user station, the streamed digital video data representing multimedia information and having a plurality of execution control routines associated therewith;

means for updating the frame counter;

means for displaying the multimedia information at the user station based on a first one of the plurality of execution control routines;

means for receiving the input signal from the input device of the client station, the input signal representing a user request;

means for determining an index based on the frame counter upon receipt of the input signal;

means for selecting a second one of the plurality of execution control routines based on the index; and

means for displaying the multimedia information at the client station based on the second one of the plurality of execution control routines.

15. The system of claim 14 wherein the frame counter relates to intra picture frames.

16. The system of claim 14 wherein the frame counter relates to predicted picture frames.

17. The system of claim 14 wherein the means for selecting a second one of the plurality of execution control routines includes means for determining a program control memory address based on a lookup table.

18. The system of claim 14 wherein the means for determining an index includes means for identifying the user request.

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